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AMERICAN VETERINARY MEDICAL ASSOCIATION

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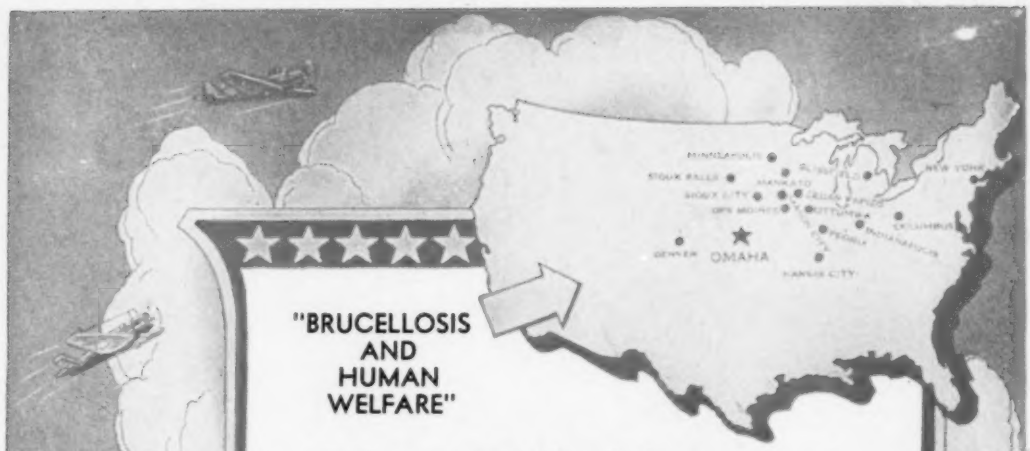
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"BRUCELLOSIS AND HUMAN WELFARE"

Embraces Agricultural Economics and Public Health

As Dr. I. Forest Huddleson, foremost authority on Brucella infections, points out in the *Puerto Rico Journal of Public Health* (March, 1947), when "the direct and indirect effects of brucellosis on human welfare are considered, the monetary losses are dwarfed into insignificance."

Furthermore, while veterinarians are conscious of the economics of farm-animal diseases, "*few* have considered how closely their professional work is geared to man's way of life and his standards of living." Brucellosis has no parallel for interrupting the flow of food from animals and causing discomfort to man.

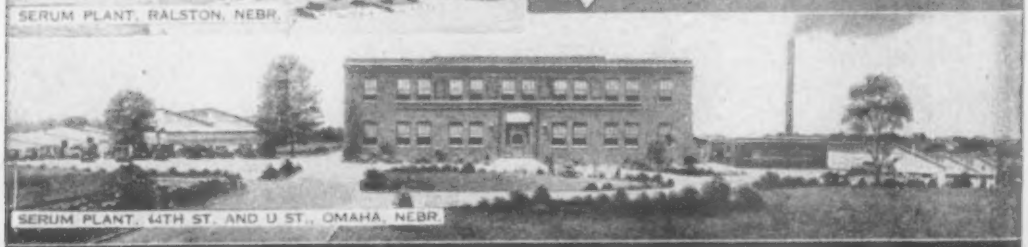


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Governor-Elect Clarke Assures Drovers Journal of His Co-operation

Chicago Daily Farmers and Drovers Journal

AMERICA'S GREATEST FARM DAILY

60TH YEAR—NO. 273. MONDAY EVENING, NOVEMBER 25, 1912. SECOND EDITION

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NIGHT LETTER

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34 CH N J 90 COLLECT NIGHT LETTER

Adel, Iowa, November 23.

EDITOR, Farmers and Drovers Journal:

I shall be quite willing to give all the assistance I can toward stamping out the ravages of the hog cholera in Iowa. I will co-operate with any who have that end in view to any reasonable extent so far as the state is concerned and so far as measures proposed will indeed be promotive of that result. Whatever I can do, I will do. Wherever I can be ...sistance, I will be found glad to lend a hand.

G. W. CLARKE,
Governor-elect.

Experimentalist Buxton Tells How to Combat the Ravages of Hog Cholera

Governor-elect G. W. Clarke of Iowa is willing to do anything he can to stamp out cholera in the Hawkeye state.

Such was the import of his telegram to the FARMERS AND DROVERS JOURNAL when asked for his assurance in furthering the efforts of Iowa farmers to minimize the hog cholera epidemic which is causing Iowa an annual loss of from $12,000,000 to $15,000,000.

The governor-elect announces that he will co-operate with any person or organization with that end in view, in so far as the state is concerned and so far as measures proposed promotive of that result.

"I WILL BE GLAD TO LEND A HAND."

"I will be found glad to lend a hand," Mr. Clarke telegraphs. This assurance coming from the incoming governor is encouraging to the farmer, who for so long has been fighting the disease individually without practically any co-operation from the state.

[Special dispatch from a staff correspondent.]

Vinton, Iowa, Nov. 25.—Never in the history of Iowa was the farmers' great industry of hog raising threatened with such complete destruction as at the present time, in the opinion of Dr. E. A. Benton, veterinary surgeon, of this city, who was interviewed to-day by the FARMERS AND DROVERS JOURNAL. He has treated many hog cholera cases in the state and knows whereof he speaks. ... some loss on the hog industry alone from cholera in this ... animals combined," he said. "A ... and care ... the last ... this state.

Reproduced from Chicago Daily Farmers and Drovers Journal, Nov. 25, 1912

Way Back When

Way back when hog cholera prophylaxis was so new that information on how to combat the disease was still first page news, that's when some of the present units of Allied Laboratories, Inc., originated the policy of

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Published in the Country Gentleman, June 20, 1914, the advertisement to the right first publicly declared the previously initiated policy of confining sales to the graduate veterinary profession.



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The Application of the Hemagglutination-Inhibition Test in the Diagnosis of Avian Pneumoencephalitis* (Newcastle Disease)

J. R. BEACH, D.V.M.
Berkeley, California

In 1941 and 1942, Hirst[1, 2] described the phenomena of the agglutination of chicken red blood cells by influenza virus and the inhibition of the agglutination by immune serum. The first attempts by the writer to apply these phenomena to avian pneumoencephalitis were made early in 1943. The factors which stimulated initiation of this work were: (1) The highly virulent nature of cultured pneumoencephalitis virus suggested that it might be related to the virus of either Newcastle disease or fowl plague even though the former originated from chickens in the United States affected with a type of disease which differed from Newcastle disease and fowl plague in other countries; and (2) the reports by Burnett[3] and Lush[4] of red cell agglutination respectively by an Australian strain of Newcastle disease virus and European strains of both Newcastle disease and fowl plague viruses.

The first attempts yielded no evidence that pneumoencephalitis (PE) virus could cause red cells to agglutinate and the studies were dropped. They were revived later in the year, however, when immunologic relationship between PE virus and that of an English strain of Newcastle disease was demonstrated.[5] The more extensive scope of this further work resulted in the demonstration that PE virus could cause chicken red blood cells to agglutinate and that such hemagglutination could be inhibited by the blood serum of chickens immune to PE. A verbal report of the results, which included much of the data given herein, was presented at the 1944 Conference of Research Workers in North America.

Professor of veterinary science, Department of Veterinary Science, University of California, Berkeley.

*The name pneumoencephalitis is used so that it will be entirely clear to readers that the disease and virus referred to are of the type encountered in the United States.

Materials and Methods

Virus—Allantoamnionic (a.a.) fluid of chicken embryos which had died in less than forty-eight hours following inoculation into the allantoic cavity with embryo-cultured PE virus was the exclusive source of the virus. The virulence of all a.a. fluid was such that the intramuscular injection of chicks, 30 to 60 days old, with 0.1 cc. of dilutions of it up to 1:1,000,000 or higher produced fatal infection. The a.a. fluid was stored in small sealed ampules in a CO_2 ice chest and one or more ampules were removed as needed for the tests. Although formalinized virus was later found suitable for the hemagglutination tests, none was used in the work reported herein.

Serum.—Serum was obtained from chickens that definitely had been affected with PE and from those which with equal certainty had not been infected with or exposed to the virus. Other sources of serum were chickens from flocks which were or had been affected with a mild respiratory disease which clinically resembled PE and chickens with various types of diseases which were submitted to our laboratory for diagnosis.

Blood Cells.—The procedure for making the red blood cell suspension is essentially that described by Hirst,[1] which is as follows:

Citrated normal chicken blood obtained by cardiac puncture was centrifugalized and the sedimented cells washed three times with

saline. After the last washing, the saline was poured off and the packed cells stored in the refrigerator. The packed cells usually, but not always, remained in suitable condition for five to seven days. Red cell suspensions for the tests were freshly prepared each day by the following procedure: 1 cc. of the packed cells was suspended in 2 cc. of saline in a graduated conical centrifuge tube and spun at 900 r.p.m. for eight minutes. After removal of supernatant fluid, a 1 per cent saline suspension of these cells was made for use in the tests. The 1 per cent suspension proved more suitable for tests with PE virus than the 2 per cent suspension as used by Hirst[1] in tests with influenza virus.

The Hemagglutination Test Procedure.—Agglutination tubes with 1-cm. internal diameter were placed in racks with coarse mesh wire bottoms so that the bottoms of the tubes were clearly visible. Doubling saline dilutions of virus in 0.5-cc. amounts, and ranging from 1:10 to 1:1,280 or higher if desired, were now made. Five-tenths cubic centimeter of the red cell suspension was added to each tube of diluted virus. A control tube containing 0.5 cc. each of saline and red cell suspension was added and the rack well shaken. After twenty-five to thirty-five minutes at room temperature (70 to 75 F.), readings were made by viewing the pattern formed by the sedimented cells on the bottom of the tube instead of by observing changes in the intensity of color of the supernatant fluid as was done by Hirst.[1] Readings were facilitated by placing the racks beneath a strong light and 4 in. above a mirror, and viewing the images of the bottoms of the tubes in the mirror (fig. 1). When there was no agglutination, the sedimenting cells formed a small disc of gradually increasing size at the lowest point of the curvature of the bottom of the tube. When agglutination occurred, the sedimenting cells formed either a thin uniform blanket covering the entire bottom of the tube (++++); a thick blanket with an irregular outline covering a portion of the bottom of the tube (+++); a small central disc surrounded with a granular area of agglutinated cells (++); or a larger central disc with slightly granular periphery (+). The hemagglutination reaction is illustrated in figure 2. The highest dilution of a.a. fluid which gave at least a ++ agglutination of red cells was termed the hemagglutination titer of the virus. The agglutinated cells soon began to slide toward the lowest point of the tube and in a short time usually formed a disc which could not be distinguished from that in a tube in which no agglutination of the cells had occurred.

Hemagglutination-Inhibition (HI) Test Procedure.—The preliminary step was to determine the hemagglutination titer of the virus. This was done each day so as to make certain that the ampule of virus and the red cell suspensions to be used would yield clear-cut reactions in dilutions at least as high as 1:320 and to determine the dilution of virus to be used in the hemagglutination-inhibition (HI) test. Next, doubling saline dilutions of serum in 0.25-cc. amounts, ranging from 1:10 to 1:2,560, or higher if desired, were made in a series of tubes. One-fourth cubic centimeter of diluted a.a. fluid was then added to each of the tubes

TABLE I—Results of Hemagglutination-Inhibition Tests with Known Serums

No. serums	Description of serum donors	HI (+ or —)	HI titers
24	PE strain C hyperimmunes.	+	1:40 to 1:10,240
4	PE strain Ro hyperimmunes.	+	1:160 to 1:10,240
4	Chickens recovered from inoculation with PE (strain C).	+	1:80 to 1:160
4	Chickens with active infection from inoculation with PE (strain C).	+	1:20 to 1:40
9	Chickens of flock which had been affected with severe PE (strain Te).	+	1:1,280 to 1:5,120
20	Chickens of flock which had been affected with very mild PE (strain Te).	1— 19+	1:10 to 1:1,280
11	Chickens of flock which had been affected with severe PE (strain K).	+	1:80 to 1:20,480
10	Chickens of flock which had been affected with mild PE (strain Pr).	+	1:20 to 1:640
7	Turkeys showing PE nervous symptoms (strain A).	+	1:80 to 1:5,120
9	Chickens of flock showing very mild PE respiratory symptoms (strain Br).	+	1:40 to 1:1,280
16	Chickens of flock which had been affected with mild unidentified respiratory disease which was definitely proved not to be PE.	—	
35	Chickens vaccinated with formalinized PE vaccine. All were refractory to challenge dose of PE virus given immediately after the HI test was made.	—	
70	Chickens immunized to fowlpox and laryngotracheitis.	—	
40	Chickens vaccinated with formalinized PE vaccine. All were refractory to a challenge dose of PE virus on 35th day after vaccination. HI tests made immediately preceding and 14 days after challenge dose of virus given. HI reaction preceding challenge dose of virus.		
	HI reaction 14 days after challenge dose of virus.	+	1:40 to 1:20,480
65	Normal chickens not affected with nor exposed to any infection.	—	

containing diluted serum and the rack was well shaken. The dilution of a.a. fluid used was one or two dilutions, usually the latter, below the highest dilution which had given a ++++ or +++ reading when the virus was titrated. For example, if the hemagglutination titer of the virus had been found to be 1:320, a 1:160 or 1:80 dilution was used in the HI test. The mixtures of serum and virus were allowed to stand five to ten minutes at room temperature, after which 0.5 cc. of the red cell suspension was added to each tube. A normal-serum control series of tubes was included. The readings were made in twenty to thirty-five minutes. A ++++ or +++ hemagglutination reaction occurred in all tubes of a series in which the serum used contained no hemagglutination-inhibiting antibodies. This was termed a negative HI reaction. When, on the other hand, hemagglutination-inhibiting antibodies were present in a serum, one or more of the first tubes of a series showed no hemagglutination, the next one or two tubes ++ or + hemagglutination, and all succeeding tubes ++++ or +++ hemagglutination. This was termed a positive HI reaction, and the highest dilution of serum which inhibited agglutination was termed the HI titer of the serum. The HI test reaction is illustrated in figure 3.

EXPERIMENTS

Hemagglutination Tests.—As stated at the outset, the first attempts at application of this test to pneumoencephalitis failed to show that the virus was capable of causing the agglutination of red blood cells. In these trials, readings were made after one hour at room temperature according to the Hirst[2] technique, after two hours in the refrigerator according to the Burnett technique,[5] or after overnight in the refrigerator according to the technique of Krueger *et al.*[6] Later, it was found that the sedimentation of agglutinated cells takes place within thirty minutes at either room or refrigerator temperature and that the agglutinated cells slide to the lowest part of the curvature of the bottom of the tube so rapidly that a test read as positive in thirty minutes might appear completely negative in an hour or so after the test was set up.

Another factor which contributed to the failure of the first experiments was the marked lack of uniformity with respect to the agglutination of red blood cells by the 20 different virulent strains of virus which were tried and also by the different generations of embryo culture of the same strain. Full explanation of this variable hemagglutinative activity of the virus was not obtained, but it was largely overcome in further studies and use of the test. It remained, however, a somewhat disturbing factor to be taken into account

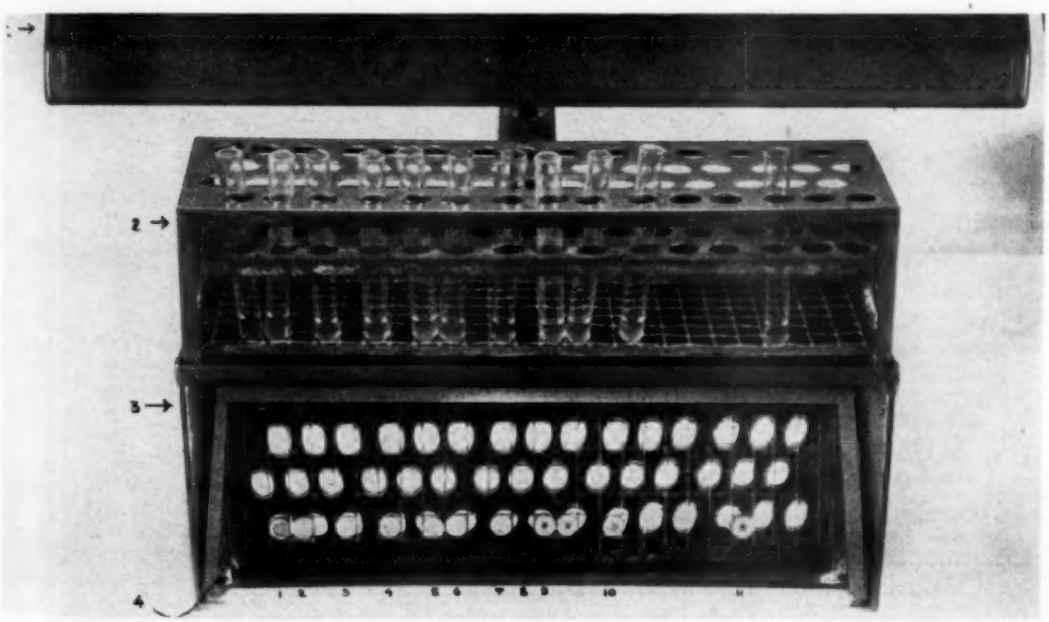


Fig. 1—Apparatus for making the hemagglutination and hemagglutination-inhibition tests and for reading the reactions. (1) Adjustable two-tube fluorescent lamp; (2) metal rack accommodating four rows of 15 tubes; (3) metal support for rack with three sides closed to keep out light; (4) mirror set at a 30-degree angle for viewing appearances of bottoms of the tubes. The clear oval mirror-images are those of the unfilled holes in the rack. Tubes 1 to 10 in the bottom row are described in figure 2. Tube 11 is a control containing only red blood cells and saline. Photo taken thirty minutes after the test was set up.

TABLE 2—Results of Hemagglutination-Inhibition Tests of Specimens Submitted for Diagnosis

No.	Description of specimen	HI test results Reac.	Titer	Neutr. titer of serum	Reac. of birds to Challenge	Diagnosis
1	2 hens. N. A. Previous PE infect. suspected. No details.	+	1:320	10^4	Refrac.	PE
2	2 hens. N. A. Previous PE infect. suspected. No details.	—	0	No test	Suscep.	No diag.
3	2 hens. Dull; dark combs; inapp.; sudden drop in eggs. Few deaths.	—	0	No test	Suscep.	No diag. Not PE
4	4 hens. N. A. Previous PE infect. suspected. No details.	+	1:1,280 to 1:10,240	10^4	Refrac.	PE
5	1 hen. Flock recov. from mild resp. dis. Inf. coryza suspected. No deaths.	+	1:80	10^4	Refrac.	PE
6	4 hens. Incoörd. neck musc. Several cases in flock. PE suspected.	—	0	No test	Suscep.	No diag. Not PE
7	20 pull. 7 mo. old. Sudden drop in eggs. No deaths. Feed suspected.	+	1:10 to 1:2,560	No test	Refrac.	P E
8	4 pull. 10 mo. old N. A. Inapp. and drop in eggs 3 mo. ago. No deaths.	+	1:10 to 1:1,280	No test	Refrac.	P E
9 & 10	6 pull. 6 mo. old from 2 flocks Na. dc.; Cough and dysp. Few deaths.	—	0	No test	Suscep.	Inf. coryza
11 & 12	9 chicks 3 mo. old from 2 flocks. Paral. legs; incoörd., neck musc. Many affected.	—	0	No test	Suscep.	Neural lymphomatosis
13	6 males 1 yr. old. Coughing in flock 1 mo. ago. No deaths.	+	1:10 to 1:80	No test	Refrac.	PE
14 & 15	5 chicks 2 mo. old from 2 flocks. Cough and dysp. Many cases. Few deaths.	—	0	No test	Suscep.	Inf. bronchitis
16 & 17	2 chicks 2 mo. old and 4 pull. 4 mo. old from 2 flocks. Cough and dysp. Few deaths.	—	0	No test	Suscep.	LT
18	3 chicks 8 weeks old. Cough and na. dc. Many cases.	—	0	No test	Suscep.	LT and inf. coryza
19 to 21	16 chicks 3 to 6 weeks old from 3 flocks. Paral. legs; incoörd. neck musc.; head tremor; dullness; stupor. Many cases.	—	0	No test	Suscep.	Avian encephalomyelitis
22 & 23	4 chicks 2 weeks and 2 mo. old from 2 flocks. Paral. legs; incoörd. neck muscl.; dull. Many cases.	—	0	No test	Suscep.	Nutr. encephalomalacia
24	13 chicks 1 to 7 weeks old. Resp. and nerv. sympt. Dis. starts with lameness on 5th day. Most deaths bet. 4½ and 6 weeks. 6% mortality.	+	1:10 & 1:320	No test	No. chall. Virus isol. from lung	PE
25	9 chicks 6 weeks old. Resp. and nerv. sympt. 18% mort. in flock of 4,500.	+	1:40 to 1:2,560	No test	Refrac.	PE
26 to 31	25 chicks 2 to 4 mo. old from 6 flocks. N.A. Recov. from mild resp. dis.	—	0	No test	Suscep.	No diag. Not PE
32 to 36	23 birds 2 to 5 mo. old from 6 flocks. N.A. Recov. from mild resp. dis.	+	1:40 to 1:5,120	No test	Refrac.	PE
37	1-mo.-old chick. Dullness.	—	0	No test	Suscep.	Cecal coccid.
38	Chick 9 weeks old. Dull and emaciated.	—	0	No test	Suscep.	Intest. coccid.
39	8 chicks 2 mo. old. Submitted for pullorum test.	—	0	No test	Suscep.	Not dis.
40	3 chicks 9 weeks old. Flock dull and unthrifty.	—	0	No test	Suscep.	Malnutrition
41	3 pull. 4 mo. old. Emaciation.	—	0	No test	Suscep.	Parasitism
42	2 chicks 1 mo. old. Weakness of legs.	—	0	No test	Suscep.	Rickets

Key to abbreviations—Dis.=disease. Dysp.=dyspnea. Inapp.=inappetence. Incoörd.=Incoördination. Inf.=infectious. LT=laryngotracheitis. Musc.=muscles. na. dc.=nasal discharge. N. A. = normal appearance. Nutr. = nutritional. PE = pneumoencephalitis. Pull. = pullets. Refrac. = refractory. Suscep. = susceptible. Neutr. = neutralizing. Reac. = reaction. Chall. = challenge.

in using the test for experimental and diagnostic purposes. The strain 11914, which had shown the least variation in hemagglutinative activity in the first experiments was used exclusively in the work described on the following pages. Strain 11914 was isolated in embryo culture in December, 1943, from a naturally infected 14-day-old chick. This strain has had rather wide distribution among laboratories of the United States for use in experimental and diagnostic work.

Hemagglutination-Inhibition Tests with Known Serums.—A series of HI tests were made with serums of chickens whose histories were known. The chickens were either those which had been used in PE experiments; those that were in farm flocks which were or had been infected with PE; those that were immunized against other avian infections; or they were normal birds which had neither been affected with nor exposed to any known avian infection. A partial list of these tests, which is illustrative of the results of the whole, is given in table 1.

From the data, it is seen that positive reactions to the HI test were obtained with the serums of all chickens which had had either artificial or natural PE infection and that all of those which had not had PE infection were negative to the test. The HI titers were extremely variable but ranged higher with serums of birds which had been hyperimmunized or had survived severe field infection. The titer, however, was not always correlated with the severity of exposure to the virus or with the degree of resistance to the disease. The fact that chickens which had been immunized to pneumoencephalitis with formalin-inactivated vaccine prepared from infected chicken embryos were negative to the test suggested that infection with active virus may be required for the production of HI antibodies in the blood. The specificity of the HI reaction was indicated by the fact that no reaction was obtained with serums of chickens affected with a mild respiratory disease clinically resembling, but definitely differentiated from, PE, or with the serums of chickens immune to fowlpox and laryngotracheitis; or with serums from chickens which had not been exposed to an infectious disease. The results as a whole indicated, therefore, that the HI test should be a valuable aid in the differentiation of pneumoencephalitis from clinically similar respiratory disease.

Hemagglutination-Inhibition Tests of Poultry Submitted for Laboratory Diagnosis.—To determine the usefulness of this test as a diagnostic procedure, it has been applied to more than 200 lots of live chickens or turkeys which were submitted to the Department of Veterinary Science, University of California, by poultrymen for diagnosis or which were brought in from the field by members of the staff. The history of the disease in the flocks from which the birds came was, in many cases, very inadequate or totally lacking. To obtain evidence of the specificity of the HI reaction for PE, the test was applied to numerous birds that obviously did not have this disease. The HI test results were usually checked by serum-neutralization (SN) tests with PE virus and/or exposure of the birds to a challenge dose of the virus. A partial, but representative, account of the results of these tests is given in table 2. The data show that all birds in which present or past PE infection was detected by the presence of neutralizing antibodies in their serums or by their being refractory to a challenge dose of virus were also detected by the HI test. The HI titers of the serums of all chickens which reacted ranged from 1:10 to 1:10,240, and in one lot (no. 7) of 20 birds, the titers varied from 1:10 to 1:2,560. Since all reactors, irrespective of the HI titer of their serum, were refractory to challenge, a titer as low as 1:10 appears to

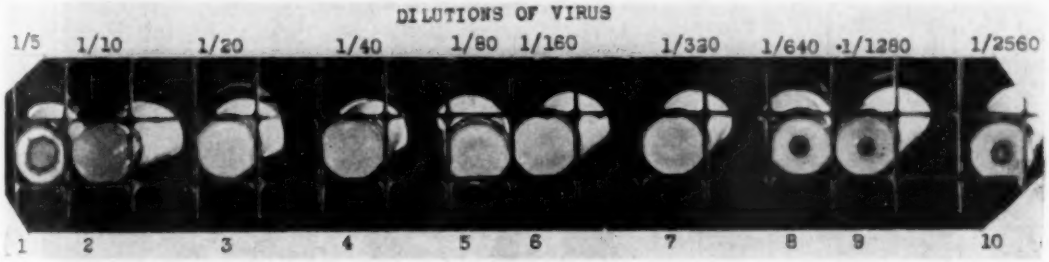


Fig. 2—Titration of virus by the hemagglutination test. Mirror-images of the bottoms of the tubes. Red cells agglutinated in tubes 1 to 7 and have settled to form a thin blanket on the bottom of the tubes. The hemagglutination titer of the virus is expressed as 1:320. In tube 1, the agglutinated cells have begun to slide toward the center. No agglutination in tubes 8 to 10. The cells in settling have formed a disc at the lowest point. The clear spot in the center of the disc of cells in tube 10 is due to irregularities in the curvature of the bottom. Photo taken thirty minutes after test was set up.

have been of diagnostic significance. The necessity of basing a diagnosis on an HI titer of 1:10, however, could probably be avoided by always taking blood samples from several chickens, because it appears unlikely that the HI titer of all would be that low if the chickens had been infected with PE. The fact that no birds except those in which PE infection was demonstrated by means of the serum neutralization test or by challenge with virus gave a positive reaction to the HI test indicated that the HI reaction is highly specific for PE. This was shown with particular clarity with specimen 34, consisting of 4 birds. Three of these gave a positive reaction to both the HI and the SN test and were refractory to a challenge dose of virus, while the fourth bird was negative to both tests and susceptible to challenge. The results, therefore, appeared to provide good evidence that the HI test is a rapid and reliable procedure for the diagnosis of both clinically obscure and symptomatically evident PE and also for the differentiation of clinically similar avian respiratory diseases from it. This conclusion has been confirmed by much further application of the test, particularly in the case of specimens coming from farms or areas in which PE has been previously identified. It is still considered advisable, however, to supplement the HI test with other diagnostic procedures in order to definitely establish the presence of PE in a new location.

TABLE 3—The Results of Neutralization and Hemagglutination-Inhibition Tests of 173 Chicken Serums

No. serums	Neutr. titers of serums	Results of HI test of same serums No. pos.	Range of HI titers
39	0	0	
21	10^1	9	1:20 to 1:320
34	10^2	34	1:20 to 1:640
36	10^3	36	1:20 to 1:10,240
18	10^4	18	1:20 to 1:10,240
14	10^5	14	1:40 to 1:5,160
11	10^6	11	1:80 to 1:10,240

COMPARISON OF THE PNEUMOENCEPHALITIS VIRUS NEUTRALIZING PROPERTY AND HEMAGGLUTINATION-INHIBITING PROPERTY OF CHICKEN SERUMS

These comparisons were made with the serums of 173 chickens. The chickens were either obtained from farm flocks in which PE was known to have occurred or were selected from those used in experimental work. In the tabulated results given in table 3, the neutralizing titer of a serum is expressed as the largest number of minimum infective doses (m. i. d's) of virus contained in a volume of allantoic fluid of an infected embryo which, when mixed with an equal volume of serum, was noninfective

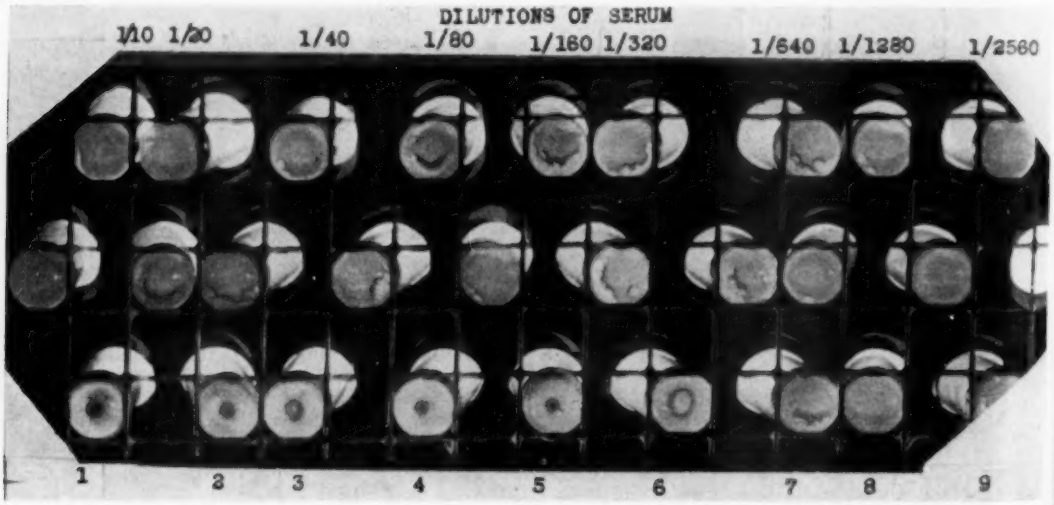


Fig. 3—The hemagglutination-inhibition test with two negative (top and middle row) and one positive (bottom row) serums. Each tube contains 0.25 cc. of a 1:80 dilution of virus, 0.25 cc. of serum diluted as indicated above, and 0.5 cc. of the red blood cell suspension. All tubes in the top and middle rows show ++++ agglutination of red cells which indicates that no HI antibodies were present in the serums. In the bottom row, tubes 1 to 5 show no agglutination of red cells, tube 6 ++ agglutination, and tubes 7 to 9 ++++ agglutination of red cells. This indicates that the amounts of serum in tubes 1 to 6 inhibited hemagglutination. The HI titer of the serum is expressed as 1:320. The irregular outlines of the blanket of cells on the bottom of many of the tubes showing ++++ hemagglutination resulted from the agglutinated cells starting to slide toward the center. Photo taken thirty minutes after test was set up.

for chickens 30 to 60 days old; the HI titer is expressed as the highest dilution of serum which inhibited the agglutination of the red blood cells by the virus.

The data show a close correlation between the ability of the serums to neutralize PE virus and to inhibit the agglutination of red blood cells by the virus. Serums having the same virus-neutralizing titer, however, had a wide range of HI titers. No definite reason for this difference in the reaction of a serum to the two tests is apparent. Two hypotheses that might be advanced in explanation of this are (1) that the property or substance in serum which inhibits hemagglutination is of a different nature than virus-neutralizing antibodies and (2) that certain serums contain an independent substance which suppresses the HI reaction.

DISCUSSION AND SUMMARY

1) The experiments reported demonstrate that the phenomenon of red blood cell agglutination by influenza virus applies also to avian pneumoencephalitis virus. Different strains of pneumoencephalitis (PE) virus and different generations of embryo culture of the same strain, however, vary in the hemagglutination property. This difference in the hemagglutinative ability of the strains of virus probably is not related to their virulence since all strains used were highly virulent. The term strain is used to indicate viruses from different sources and not immunologic or other differences in their nature.

2) Since the virus of PE has been shown to be immunologically related to the virus of Newcastle disease, these results may be said to have confirmed the findings of Burnett[3] and Lush[4] with respect to the agglutination of chicken red blood cells by the latter virus.

3) The agglutination of red blood cells by PE virus was found to be inhibited by the serum of chickens and turkeys which had been infected with the virus. The results of extensive application of the hemagglutination-inhibition (HI) test to serums from many sources indicates that the reaction is highly specific.

4) A close correlation was found between the ability of serum to neutralize the virus and to inhibit the agglutination of red blood cells by the virus. Serums having the same virus-neutralizing titer, however, had a wide range of HI titers. Two hypothetical reasons advanced in explanation of this variance are (*a*) that HI and virus-neutralizing antibodies may be independent substances and (*b*) that an independent substance which suppresses the HI reaction may be present in some serums.

5) The results of application of the HI test to chickens and turkeys on farms indicate that, ultimately, it may prove to be a rapid and reliable method for the diagnosis of PE and thereby simplify the rather difficult task of differentiating PE from clinically similar diseases of poultry in the United States.

6) The HI test has been used routinely in the diagnosis laboratory of the Department of Veterinary Science, University of California, for more than three years. The test is now regarded as a highly reliable means of identifying PE in chickens coming from areas in which the disease is known to have occurred. The HI test alone, however, is still considered inadequate to establish the presence of PE in an area previously believed to be free of the disease. An advantage of the HI test is that, since it can be made with formalinized virus, it can be safely used as a preliminary diagnostic procedure on suspected PE cases in areas in which the disease has not previously been identified. Finally, experience has shown that the HI test must be painstakingly done and the performance of all materials used in it must be constantly checked in order to secure uniform and clear-cut results.

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"The Golden Gate in '48"

Four Decades of Veterinary Progress

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LOOKING back forty years in veterinary progress, one sees a situation which, in many respects, is much different from that we have today. At that time glanders, dourine, sheep and cattle scab, cattle tick fever, hog cholera, bovine tuberculosis, and brucellosis were among the inhibiting factors to our livestock production.

Forty years ago, in entire southern states, luxuriant pasture grasses—Lespedeza, Bermuda, and others—grew half-knee high, but without any worthwhile cattle to feed upon them, and not a creamery in some of these states. Today, in these areas, both the dairy and beef cattle businesses have assumed industrial proportions, for the cattle tick is gone except for a narrow strip or two where we are exposed to infection from another country.

We have heard of reclamation projects where the deserts were made to bloom, but the reclamation brought about by the cattle dipping vat filled with arsenical solution equals anything that has yet come to attention. One may argue as to the wisdom of bringing additional arid lands under the plow, but there can be no argument against purging livestock of disease such as is spread by the cattle tick.

Some of the tasks undertaken in suppressing disease have been so great that weaker hearts might have been discouraged. Could anyone contemplate the labor and money involved in the dipping of cattle in ten southern states every two weeks for a period of several years; especially where in many incidents, tired mothers and weary children brought the cattle to the vat while the men toiled in the cotton and the corn fields?

Could anyone contemplate the completion of a task that involved nearly 300,000,000 biologic tests and the slaughtering of 4,000,000 cattle, with all the related expenditure of labor and money? That's what happened in tuberculosis eradication work.

It is like a man whose boat sinks far from shore, or whose horse breaks its leg in the desert. The entire effort required to reach safety is overwhelming, but one stroke at a time or one step at a time may be enough to do the job.

Looking backward again, we recall that 57 per cent of the dairy cows in the milkshed of one of our largest cities was marked with the "T" brand and sent to slaughter.

In one state, almost a million cattle reacted to the tuberculin test and were slaughtered. Whole hospital wards were devoted to the treatment of children suffering mostly, we are told, from tuberculosis of bovine origin.

Federal meat inspection records—antemortem and postmortem — have always given a true picture of the general geographic location and the extent of diseases and parasitic infections of food-producing animals. This inspection service at times has led to locating diseased animals upon the farm or range. The projects of eradication of the cattle tick, sheep and cattle scab, and tuberculosis have been greatly benefited by federal meat inspection service.

The records of this inspection service during 1917 show that 219,991 cattle were retained for tuberculosis on the regular kill. In 1946, the retention for that disease was only 17,112, a decrease of slightly more than 92.2 per cent, notwithstanding the fact that the kill in 1946 had increased by 35 per cent over 1917. The most spectacular reduction reflecting accomplishment in the tuberculin testing, however, is with regard to condemnation and sterilization of swine on account of tuberculosis. In 1917, there were 76,807 hogs in this category. Beyond this, there were nearly half a million primal parts condemned. In 1946, there were only 10,514 hog carcasses condemned for tuberculosis, and the number of primal parts condemned was less than 50 per cent of the number condemned in 1917.

It is noteworthy that the work of tuberculosis eradication was so handled that there was no aversion to drinking milk or eating meat. Neither the dairy nor the

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beef industries were stigmatized as a result of the movement of so many tuberculous animals to slaughter.

Not today, but sometimes, we hope there will be a means of permanently identifying cattle and other livestock in the communities where disease exists. Then, when these animals go to slaughter, such disease detected on antemortem or postmortem inspection may be reported back to the state of origin where a record of the identification is kept. The herd from which the diseased animal originated could then be subjected to such treatment as is necessary. This process, which might be called backtracking, is already being employed in some states with excellent results in locating tuberculous herds. The plan presupposes that in the vaccination against brucellosis, and in the tests for both brucellosis and tuberculosis, some permanent means of identifying the animals will be used.

We know that there are some tuberculous cattle still with us, and that some of us seem to have relaxed our efforts in taking them out. True, the situation has not been ideal for several years—many of the veterinarians have been in military service—but we should all realize the hazard to public health, the economic setback to the industry, and the loss of our own prestige if the disease should get out of control. Let us not allow that to happen.

The committee on tuberculosis of the United States Livestock Sanitary Association recently directed attention to the serious consequences growing out of the lack of interest on the part of some veterinarians who test cattle for tuberculosis. Can it be that some of us are incapable of assuming the responsibilities involved in such a broad and important undertaking? Is it possible that we do not recognize tuberculosis as an important health and economic factor and consequently deal with it in a perfunctory way?

Everyone here is conscious of the many problems in brucellosis work, but beyond these problems are some encouraging results.

Not too long ago—not long enough, in fact—one could buy a remedy with a guarantee to cure brucellosis in cattle. This was being shipped to jobbers in carload lots, and the testimonials as to its virtues as a curative were numerous.

No one has all the answers to the problems of brucellosis, but we have come a long way since that time. The states have set up comprehensive plans—most of them variable enough to accommodate any herd situation—and I share the view of many who feel that *Brucella abortus* vaccine, judiciously used, will afford a great measure of protection against severe losses due to actual abortions, even in extensively infected herds. This does not discount the need for the test, nor for sanitary measures.

Sometimes, veterinarians write articles for farm papers and other journals, in which they outline how far the states have drifted away from any logical program for the control of brucellosis. Only recently an article of this kind was brought to my attention. In it, the veterinarian severely criticized the programs of several states and set forth what, in his mind, was the logical course to pursue. Even though he might be right and the official programs wrong (and I don't think they are), would it not have been better for the veterinarians to wash their linen in private, so to speak. I wonder if these men realize how long some veterinarians have been striving to improve social and professional standards, and above all, the health of the livestock. I wonder if we have all been properly indoctrinated into our own profession.

Brucellosis is a disease which takes away the "bloom." Many show herds, which were put out of business on account of it, are now back on the circuits. Commercial dairymen with a high percentage of turnover—these represent the bulk of problem herds—are being helped by their veterinarians to successfully combat the disease, as evidenced by the greatly increased milk production in this class of herds.

The fact that the practicing veterinarians in most of the states are able to participate in the public projects of animal disease control, *i.e.*, tuberculosis and brucellosis, gives practical assurance of the successful culmination of these undertakings.

Time was when no arrangements had been made for payment for the service of this group, and much ill feeling was engendered in some sections as a result. But the livestock and consumer interests have come to know the real and potential value of practicing veterinarians in undertakings of disease control.

In our thinking, provincialism has been largely set aside. Our perspective has widened. We have grown up. Each state and many of the commercial firms have research institutes where earnest workers find new and better weapons for attacking disease problems.

With meager equipment and limited sources of information, the earlier workers in veterinary research and medicine made discoveries and established principles upon which much of our disease control work today is based, all of which testify as to the caliber of these individuals.

The discoveries and developments that continue to come to attention offer promise of a continuation of successful attacks against many diseases and conditions heretofore quite perplexing.

These new developments may suggest that some changes should be planned, for progress is usually made by a departure from the beaten path while still following the old trail closely enough to keep our bearings. We must look ahead to fit our program to the new needs and the new developments that may reasonably be anticipated.

All projects involving the expenditure of public funds rightly call forth discussion and criticism. In short, what sometimes happens is that several states set up regulations and laws for the suppression of disease, hand these to the state and federal regulatory forces, and say "Now get the job done." But conflict of interest arises between groups of livestock men, some of whom feel they would be affected adversely by the operation of the law. Veterinarians of different schools of thought take opposing views, and the lay writer, usually disappointed because someone does not produce a test that is 100 per cent accurate, is especially chagrined. Consequently, the regulatory man, who up to this time has said nothing, finds that there is an open season on him. At any rate, the indictments, especially against tuberculosis and brucellosis, are of such nature that successful prosecution is relatively certain.

Generally speaking, it would seem that the states' approaches to the disease control problems must have been well founded and in keeping with the desires of the large majority of livestock interests. Otherwise, the measure of success would have been much less.

All well-organized and operated businesses set aside a time when they take inventories and try to determine the losses or gains of their past efforts as measured by the firm's unit of value. Perhaps, in a way, we could do that. On the side of the ledger where we use the red ink, there is to be found the unrealized hopes and aspirations of countless veterinarians who entered animal disease control work with the zeal and fervor born of the knowledge that in their line of duty was a worthy task to be performed. Perhaps their program was not understood. Perhaps they were "taken out" in a political whirl, or perhaps they succumbed to the taunts, jibes, and hecklings of someone who had neither stake nor responsibility in the undertaking. The trail of animal disease control has been a hard one, and it is strewn with human wreckage for causes like these.

On the other side of the ledger, in black ink, are found the names of men, some of them written a long time ago and some quite recently. But most in evidence are the varied results of their labor, for some were bacteriologists, some chemists, some biochemists, some pathologists; some were parasitologists whose labors took them into mucky barnlots; some were writers who told of what could be accomplished by the discoveries of the scientific group; and others were leaders of men and were largely responsible for the substantial support which has been given to implement the overall tasks.

Many of our benefactors are not here today, but the influence of their accomplishments keeps step with us and encourages us to go forward in the pursuit of those things that will benefit and advance mankind.

There is nothing new in this paper. The intention is only to relate some of the numerous things which have happened during the last four decades. I like to think of the many grand fellows I have met. I like to hear about what has been done. I like to think that what is necessary to be done is, or at some time in the future will be, within the realm of possibility. I like to think that men can argue and remain friends and each contend for what he feels is best. But, above all, I like to feel that the pull of our common objective is so strong that our pathways will continue to converge more and more as time goes on.

The County Agent and the Practicing Veterinarian

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I HAVE BEEN concerned for a long time over certain antipathies which seem to exist in many parts of the country between practicing veterinarians and county agents. I see no fundamental reasons for these differences. Certainly they do not help either of the parties concerned, and they often work injury to the agriculturist whom both are serving. I think an effort should be made to iron out these differences. If this paper can stimulate a start in this direction, it will have served its purpose.

Our animal industry always has been, is now and, we fervently hope, always will be the foundation stone of our agricultural economy. This fact is significant. It has aided immeasurably in maintaining the fertility of our soils; it has contributed substantially to the maintenance and improvement of our national health. The American people are the best fed of the large nations of the earth. It is no accident that successive generations of our people are taller and better physical specimens than our ancestors. To a higher degree than any other nation, our people have access to a wide variety of foods of animal origin—not only meat, but milk, butter, cheese, and eggs, and many products derived from them. These are the best protective foods, the sources of vitamins and minerals which are so necessary to the maintenance of perfect health.

Americans like these foods, and they consume as much as their means will permit. Unfortunately, these foods are relatively expensive, if we compute the price solely upon the basis of the caloric cost. When the masses of our people are prosperous, as they are at present, these foods are in demand in spite of relatively high prices. When hard times come, the demand for them slackens in favor of cereal foods which furnish calories much more cheaply. As H. E. Babcock has been showing so well in his articles in the *Country Gentleman* and *The Saturday Evening Post*, we have the urge for a better diet, for one containing more products of animal origin; a demand for such foods exists which never has been even approximately satisfied.

It is a part of the duty of the county agent and the veterinarian to stimulate the production of foods which improve the diet. It is their duty to improve methods of production of such foods to the end that the men who engage in such industries will receive a fair return for their labors, while at the same time an abundant supply will become available at prices which the consumer can afford to pay. The lowering of the costs of producing animal foods depends upon the development of greater efficiencies in the industry, just as surely as such improvements lowered the cost of automobiles, radios, and other gadgets of modern life, bringing them within the means of great masses of people. The lowering of these costs depends upon several factors that are immediately apparent, *viz.*:

a) Improved efficiency in the production of animal feeds.

   Much has already been done in this area, such as the development of hybrid corn and better varieties of other grains, of new types of ensilage, of new forage grasses, and pasture improvement.

b) The development of better breeds and strains of livestock that will use foods more economically.

   In this area, great improvements have been effected. We have better breeds of beef cattle, better dairy cows, and better laying hens than formerly. Recent interest in hybrid livestock breeds appears to offer great possibilities for the future.

c) The development of better methods of husbandry.

   By this I mean further developments in labor-saving machinery and methods, such as milking machines and other milk-handling equipment, better egg-handling equipment, more scientific barn construction based upon time and motion studies, better education of farmers in ways and means of keeping their stock comfortable and in good produc-

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ing condition, and in recognizing and culling out unprofitable stock.

d) Better utilization of available means of keeping livestock free of disease.

As we all know disease can, and frequently does, destroy all the gains that may be made in other directions. Animal efficiency is always lowered and often destroyed by disease. In this connection, we should remember that losses from diseases are only in part due to deaths. According to the U. S. Department of Agriculture, the losses from ailments which lower efficiency but do not kill are greater than those which kill outright.

In disseminating this knowledge to the man on the farm, the county agent and the practicing veterinarian are the two key men. Both are scientifically trained. Their training has been somewhat different; each has expertness in certain phases of this work. They should work as a team, each recognizing and respecting the spheres in which the other can best advise. Neither is properly serving his clientèle when he fails to do this.

In speaking of antipathies between county agents and veterinarians, I do not want to exaggerate the problem. In a great many cases—in a majority, I think—these men do work in harmony, each supplementing and increasing the efficiency of the other. Neither do I want to infer that when cooperation does not exist the fault is always on the side of the county agent. It takes at least two to make a quarrel, and, quite frankly, the veterinarian has been at fault in these cases about as often as the county agent. By and large, county agents are honest, well-meaning men who are conscientiously trying their very best to give good service. I am equally certain that this is true also of most veterinarians. Fundamentally, they are the same kind of people. Most members of both groups were farm boys before they went to college and specialized in different fields of knowledge. Whatever differences they have are honest ones due to failure to understand and appreciate the viewpoints of the other.

County agents are always salaried men, whereas veterinarians usually operate independently as private practitioners. In this difference, we find the basis of many of the complaints of veterinarians against the county agents. When the latter makes it his practice to advise stockmen on disease matters and, worse yet, when he actually administers treatment to ailing animals, he is sure to incur the animosity of the veterinarians who practice in the area. The degree of this animosity depends upon the personalities of the persons involved, the extent to which the county agent transgresses on the field which the veterinarian feels is his own, and the amount of work which the veterinarian has to do.

In the areas where livestock are concentrated and when there is agricultural prosperity, the practitioner is usually very busy and is less apt to resent such activities of county agents. In less prosperous areas and in less prosperous times, when the practitioner is not busy and when he may be having difficulty in making a satisfactory living, his resentment will be greater. You may call this a selfish attitude. If so, it is a very human attitude since it does involve the livelihood of the man and his family. It may be argued that the county agent is justified in advising farmers on veterinary matters since he is employed for the purpose of assisting them in every way that he can, and that farmers expect and demand such service. It seems to me that the answer to this argument is clear. County agents are not expected to be omniscient, or, if some farmers do have such faith in them, it is up to the agent to disillusion them. The diagnosis and treatment of disease in animals is a highly developed and complex science which can be mastered only by those who have had extensive training in the specialty. This is recognized by the veterinary practice laws of the states. Such laws were not set up to protect veterinarians; they serve to protect the public against persons who are not adequately prepared but who otherwise may deceive the public into thinking that they are competent to deal with livestock diseases. County agents, except for a few who have veterinary degrees, are not competent to deal with livestock diseases. I say this with no disparagement whatsoever. It is just not possible for one man to be a specialist in many fields. It is obvious, therefore, that county agents will usually serve their areas best on disease matters by refraining from trying to handle such problems themselves and referring them to the local practitioners.

Even on the educational level, most private practitioners will gladly assist the

local farm bureau or the Grange by appearing on programs to discuss disease prevention matters. In the interest of good feeling, the county agent should at least invite him to do so. If he does not choose to accept, he cannot object to others doing so.

At the present time, there is a shortage of veterinarians in this country. This is in process of being remedied through capacity operation of the ten established veterinary schools and the formation since the end of the war of seven additional schools. The shortage will continue for some time; in fact, we will not have an adequate number to supply reasonable demands for at least a half dozen years. Under such conditions, it is not surprising that we also have a maldistribution of practitioners. The present day graduates are in great demand, and they tend to congregate in the congested livestock areas where conditions for practice are easier and more remunerative than in the sparsely settled areas. Many areas in the country that will support practitioners do not now have them, but they will be supplied within a few years. There are other areas, however, that never have had veterinary practitioners and never will have them, although there is need for them, unless some form of subsidy is developed to induce veterinarians to locate there. These areas are submarginal, so far as private veterinary practice is concerned, because the animals are so few or of such low value, and so widely scattered that a practitioner cannot make a fair living. When the population pressure of veterinarians becomes greater, as it certainly will within a few years, the less desirable areas will be occupied. This will progress from the more desirable to the less desirable down to the marginal areas. Pressure of competition will force such distribution.

In general, the more competent men will find their way into the more desirable areas and the less competent will be forced to seek pastures less green. So far as any particular area is concerned, it is rendered less attractive to a good veterinary practitioner if farmers have developed the habit of calling a veterinarian only in cases of great emergency. Many areas haven't service for such emergencies because veterinarians cannot live on emergency calls alone. These areas have been made submarginal for them because of the attitude of the people in them. If such an area wants a good veterinarian at hand, it will have to make it possible for him to earn a living there.

It is said, and I have no difficulty in believing the statement, that the American public spends more money each year for patent medicines than it does in doctors' fees. One has only to look over the shelves of any drug store to realize what magnitude this business has assumed. A deep knowledge of medicine is not necessary to know that most of this money is wasted. It is apparent also, from the advertisements which appear in many of the farm magazines, that the American farmer spends enormous sums each year on useless mineral mixtures, tonics, garget cures, liniments, and other home remedies. Probably most of these do little harm, except to the bank account of the farmer.

In another category are the virulent disease-producing agents such as hog-cholera virus, and vaccines such as those for anthrax, chicken pox, and laryngotracheitis of chickens. These agents, in the hands of the untrained or half-trained, may cause outbreaks of disease not only in the herds and flocks where used but in those of neighbors as well. We flatter ourselves as being in the forefront of civilized nations, but in some respects we lag far behind. No other country on earth with a reasonably high educational level permits the handling of such agents by any other than highly trained personnel. The mishandling of hog-cholera virus has served to keep this destructive disease alive in this country, and both fowlpox and laryngotracheitis are being spread by improper use of vaccines.

County agents can do their consultants who are livestock owners a service by persuading them that the treatment of disease is a highly specialized science which can be best and most economically rendered by a good veterinarian. He should discourage their buying a host of remedies from the drug store because, after all, logical treatment can be administered only when an accurate diagnosis has been made. The farmer seldom can be sure of what he is treating and of the complications that are likely to ensue. He should especially be discouraged in using dangerous viruses and vaccines, unless he has had extensive experience with them previously.

I have travelled in all parts of the United States and I am aware that conditions vary

widely. The remarks that I have made so far are applicable to those parts where veterinary practitioners are available. In the great range areas where practitioners are not available within reasonable distances, the farm and ranch owners are forced to handle disease problems as best they can. In such areas, county agents cannot be criticized for acquiring as much information about diseases of livestock as they can get and passing it along to those who need it.

Farmers sometimes complain about the high cost of veterinary services. Some appear to regard veterinarians as parasites who prey upon their misfortunes. Such people fail to recognize that disease is an inevitable part of the cost of raising livestock, and whether this expense is large or small depends partly upon luck but largely upon their own ignorance or carelessness. We have a social problem here, just as in human medicine; a problem of how to spread the cost of veterinary services in such a way as to make them less burdensome to the small farmer and at the same time to find a means of compensating the veterinarian reasonably so that a good man can be available. We also have the problem of how best to set up a service which will prevent disease rather than one which patches up the damage after it has occurred, which is our present system.

Emergency veterinary work will always be needed, but a much larger field for valuable service lies in the prevention of disease, or at least in early diagnosis before serious damage has been done. I refer to advice which will reduce the mortality in young pigs and chicks, detect breeding irregularities in dairy cattle before they become incurable, reduce the ravages of brucellosis and bovine mastitis, detect and treat for intestinal parasitisms, and, in general, keep animal health on a high level of efficiency. Most country practitioners now spend a great deal of time riding about the country to reach their patients, and since most of their calls are of an emergency nature they can do comparatively little planning to reduce this mileage. Naturally, they must charge for this time. The working day of the average country practitioner is long, his work is often laborious and disagreeable, especially during the cold months. His compensation never makes him rich and seldom more than moderately comfortable. If farmers could be persuaded that prevention is better than cure and that they would often be better off to call the veterinarian at regular intervals for a general health check-up, rather than to call him for emergencies only, such work could be planned in advance and done more economically than at present. The Code of Ethics of their profession prevents veterinarians from soliciting work; hence, they cannot organize such plans unless their clients ask for them. Actually, there are many good breeders who have such working arrangements with their veterinarians, and I think these plans usually have worked to the satisfaction of both veterinarian and client. County agents could, if they thought well of the idea, instigate such plans in their counties.

In discussing the county agent—practicing veterinarian relationship, I have dwelt largely with the veterinarians' side of the matter for the reason that I know more about this aspect. Undoubtedly, the county agent has problems that are not as clear as they should be to the veterinarian. As I said in the beginning, I think that we, as two great professional groups that have a job in common to do, should try to get together on our problems. The American Veterinary Medical Association has a Committee on Public Relations which concerns itself with matters of this sort. In closing, I should like to present an invitation to your Association to delegate one of your regular committees, or a special one if you like, to meet with our group to initiate discussions on this problem looking forward to a better and more effective working relationship. Our associations should get better acquainted; we should talk over our problems, and when we do, I am sure we will lay the ground work for a more amicable and effective relationship.

Differentiating Sex Difficult in Gorillas.—According to Dr. Leonard J. Goss, New York Zoölogical Park (*Zoölogica*, July 31, 1947), it is difficult to distinguish the sex of a gorilla owing to the hairy genital region, the relatively small genitalia, and the difficulty of handling the animal for examination. Moreover, there is considerable individual variation in the development of the external genital organs of the gorilla.

Developments Affecting the Army Veterinary Service

Colonel JAMES A. McCALLAM, V. C., U. S. Army
Washington, D. C.

THE Surgeon General of the Army, Maj. Gen. Raymond W. Bliss, has asked me to convey to the members of the American Veterinary Medical Association his greetings and his wishes for a most successful meeting.

Before proceeding to the items which pertain to the Army veterinary service, I desire to dwell for a moment on a subject of national interest, and one in which the veterinary profession may well be called upon to assume an important rôle.

World War II demonstrated that modern war is a total war; that the entire national economy must be converted into a coördinated endeavor, which includes and requires coördination of military, industrial, and civilian mobilization. Many developments occurred during the past war in the field of science which contributed to the successful prosecution and winning of the war. It is common knowledge that gas and biological agents existed, but such were not used in World War II. It is more important today than ever before that scientific research and development continue. We as a profession have a vital personal interest, I am convinced, in the field of research and development in its application to any future war. Particularly, I have reference to radiation effects from atomic explosion, and other aspects of atomic warfare. In this connection as a matter of vital interest to the veterinary profession, civilian and military, and projected only as food for thought, is atomic energy and the possible demands that may be made on the veterinary profession relating to the effects of atomic warfare in connection with livestock, agriculture in general, and public health, particularly food supplies. I mention a few significant questions to which answers should be provided:

What is the tolerance of radiation for the various species of livestock?

How may radiation sickness in animals be detected early, properly diagnosed, and a prognosis made?

What will be the effect of radiation exposure on breeding stock?

What effects may radiation exposure have on dairy cows, relative to milk production?

What is the danger in consuming milk or meat from animals subject to uncontrolled radioactivity?

What effect would forage subject to radiation exposure have on animals eating it?

How and when should exposed animals be slaughtered? Would special technique and deviations from normal procedure be necessary?

What effect would radioactivity have on canned foods, foods in boxes, bags, or packages in cold storage or dry warehouses?

There are other questions pertinent to the subject which could be raised. I think the few set forth will indicate that serious consideration must be given to the subject of atomic explosion by the veterinary profession in its rôle as guardian of the livestock industry, and in the interest it has in the field of public health and welfare.

Another point I feel should be interjected is that, in any future national mobilization, the veterinary profession will have a responsibility and an interest greater than in the past and again must participate actively. To discharge that responsibility effectively for the best interest of the country, and to conserve and utilize the services of the veterinary profession economically in the conservation of livestock and in the interest of public health and welfare, plans must be prepared in advance of such national mobilization. Briefly, such a plan must be predicated on a study of the requirements involving all types of veterinary service including the practitioner, the various government using agencies, and the schools of veterinary medicine. Consideration must be given to personnel requirements, the procurement and assignment of personnel, the conservation and effective utilization of veterinarians, and the facilities of veterinary medicine. Rather than working separately, the efforts of the various interested divisions of the veteri-

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Chief of the Veterinary Division, Office of The Surgeon General, U. S. Army, Washington, D. C.

nary profession could be coördinated and directed through a committee of the AVMA. The time to plan for the effective utilization of the veterinary profession in any national mobilization on a wartime basis is before — not after — the blow strikes.

Since I appeared before this association last year, a number of developments have occurred in the military service in which as citizens and as members of the veterinary profession you have more than a passing general interest. Therefore, the purpose of this paper is to discuss briefly certain subjects which are of particular concern to us all, not merely in our rôle as members of the veterinary profession but as citizens of the United States.

The Congress in 1946 authorized a strength of 50,000 officers for the Regular Army. The difference between the number then in the Regular Army, approximately 11,000, and the 50,000 authorized, less 10 per cent temporarily withheld, would be procured from among those eligibles desiring to compete who had active service as officers in one of the components of the Army of the United States, between Dec. 7, 1941, and Dec. 31, 1946. The authorized strength of the Regular Army Veterinary Corps has been set at 200 officers, less the 10 per cent withheld* To date 94 veterinary officers have accepted appointments in the Regular Army, 71 in July, 1946, 11 in August, 1946, and 12 in February, 1947. Fifteen veterinarians tendered appointments in the Regular Army declined to accept commissions; and, of the 94 appointed since July, 1946, 2 have resigned from the Army. None could be offered appointment in May, 1947, when the fourth increment was announced. This was due to the fact the Corps was then 5 over strength of the 180 authorized. Retirements and resignations have since reduced that number. It was realized in my office that if commissions could not be offered to additional qualified officers currently available, the training and experience of these officers would be lost to the Army. Accordingly, a memorandum was prepared and signed by The Surgeon General, for consideration of the War Department General Staff, strongly recommending additional spaces be authorized the Veterinary Corps, the temporary overstrength to be absorbed by normal attrition. This was granted and the temporary overstrength slots will come out of the authorized Medical Department total. Therefore, appointments will be offered in the Veterinary Corps to some of those on the eligible list when the next increment of officers is taken into the Regular Army, which will be prior to Dec. 31, 1947, probably in September or October.

Following completion of the current integration program, the officer strength of the Regular Army will be augmented and maintained from the following sources as prescribed in War Department Circular 101, 1947:

a) Graduates from the United States Military Academy.

b) Persons designated as honor graduates of senior division Reserve Officers Training Corps units.

c) Commissioned officers of the Officers Reserve Corps, National Guard, and Army of the United States who have demonstrated their fitness to hold commissioned grade in the Regular Army by performance of extended active duty under the provisions of part four of this circular.

d) Persons qualified for appointment in the Medical Corps, Dental Corps, Veterinary Corps, Pharmacy Corps, Corps of Chaplains, and the Judge Advocate General's Department under the provisions of part four of this circular.

The age of officers appointed in the Veterinary Corps, Regular Army, under the provisions of the circular quoted must be between 21 and 32 years on date of appointment.

After Jan. 1, 1948, appointment of persons qualified for commissioned grades in the Veterinary Corps of the Regular Army will be made from the following sources:

a) *Group* 1.—From Veterinary Corps officers of the Officers Reserve Corps, National Guard of the United States, and Army of the United States who have demonstrated their fitness to hold commissioned grade in the Veterinary Corps of the Regular Army, after having performed at least one year of continuous extended active duty after June 30, 1947, and are recommended for appointment in the Regular Army by the commanding officers under whom they performed such active duty.

b) *Group* 2.—Direct appointment of any qualified person, military or civilian, as a result of a competitive professional examina-

*Since presentation of this article, the strength of the Veterinary Corps, Regular Army, has been set at 186. *See* article in December, 1947, JOURNAL, pp. 541-542, entitled "Army Needs Veterinary Officers."

tion prepared and administered by The Surgeon General. Such professional examination will be conducted in three parts: oral, practical, and written.

Briefly, the general plan provides for a competitive tour of observed active duty of one year in duration. Such tours of active duty will begin on or about July 1 or January 1 of each year. Officers entering extended active duty for this purpose will be required to sign a category VIII Voluntary Statement, that is, to serve two years.

For detailed information relative this subject, your attention is invited to War Department Circular 101, dated April 19, 1947.

A strong and active organized Reserve Corps is essential to our national security, in time of peace and in time of war. I am pleased to state many veterinary officers, following separation, accepted commissions in the Veterinary Reserve Corps. The value of the Reserve Corps does not rest in numerical strength, *per se*, but in the active interest each member maintains through participation in its program, to the extent his obligations in civil life permit. To make the Reserve Corps an effective component of the Army, an attractive program of training must be assured, and certain benefits offered to compensate for the time and effort of the individual. The Surgeon General is developing a long-range plan for the organized Reserve Corps in accordance with the overall War Department policy, but modified to meet the needs of the Medical Department. I am not in a position to give you the details of this plan, but briefly the objectives are aimed at providing active and inactive duty training for Reserve officers so that their participation will cause a minimum of interference with their civilian obligations and, at the same time, the training program will be interesting, effective, and beneficial.

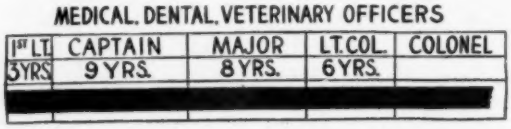
Requests were received from several of the schools of veterinary medicine for the establishment of veterinary ROTC units. Our endeavor during the year to secure authorization for such units was unsuccessful. I consider a veterinary ROTC unit a most valuable adjunct to the Reserve Corps program. The effort for the authorization and establishment of these units is being continued.

The personnel situation during the year has become increasingly critical. It was made more acute when the separation criterion for veterinary officers was reduced to twenty-four months. Replacements for those separated have been negligible. We have been unable to fill requisitions for veterinary officers needed and required to meet our obligations, either in the United States or overseas. I do not know a satisfactory solution to the problem, as over 50 per cent of the total authorization of officers for the Army must be other than Regular Army if the strength of the Army is kept at a half million or more. There are at present 423 veterinary officers on active duty; of these 179 are in the Regular Army, and 244 are serving in various categories under temporary commissions in the Army of the United States. There is a shortage of approximately 40 veterinary officers as of today; this will increase each month and, consequently, our plight become more difficult. Should any separated officer be interested in recall, or should any qualified veterinarian without prior service desire active duty, address your communication to the Chief, Veterinary Division, Office of The Surgeon General, U. S. Army, Washington 25, D. C.

You are all aware that a bill was introduced in the 80th Congress providing for the procurement, promotion, and elimination of Regular Army officers, and that after many amendments the bill was passed by Congress and became law when signed by the President on Aug. 7, 1947. The short title of this act is cited as the "Officer Personnel Act of 1947." In view of the great interest and concern manifested by the veterinary profession, particularly relative to those provisions of the bill affecting the Veterinary Corps, the members of this association are entitled to an explanation of the bill, which of necessity must be brief, and the reasons for some of the provisions contained in the Act. What follows, therefore, is for the purpose of orientation.

The promotion law under which the Army previously operated was contained in the National Defense Act of 1916 and amendments thereto. There were two lists, one known as the single list or promotion list officers. It contained all officers in the Army, except those of the Medical Department and the Chaplains who made up the second list, the latter being referred to in the law as nonpromotion list officers. Under

this law a line officer reached the grade of first lieutenant in three years, captain in ten years, major seventeen years, and lieutenant colonel after completing twenty-three years of service, and was not eligible for promotion to colonel until the completion of twenty-eight years' service, but could not be promoted to the grade of colonel unless a vacancy existed because the total number in that grade was limited by



Graph 1—Previous system of promotion—medical, dental, and veterinary officers.

law. This system was based on seniority alone, that is, the senior officer in point of service in the next lower grade was promoted, if physically qualified, when a vacancy occurred. It resulted in line officers serving in the grade of captain who were 31 to 37 years old, majors 38 to 49 years of age, and lieutenant colonels who were 44 to 60 years old.

The medical, dental, and veterinary officers and the chaplains entered the Army as first lieutenants and were promoted to captain in three years, to major in twelve years, to lieutenant colonel in twenty years, and to colonel in twenty-six years. There was no limitation on numbers in any grade.

Both schedules of promotion, the single or line list and the nonpromotion list, were unsatisfactory to the War Department for a number of reasons.

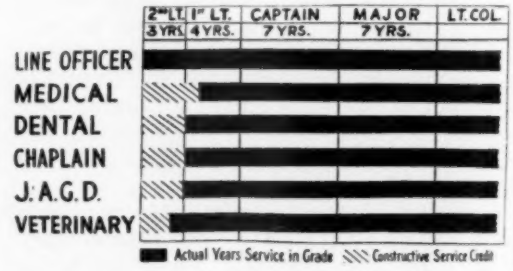
The Act, which became law on Aug. 7, 1947, and under which the Army will operate in the future, provides for several promotion lists, among which are: the Army promotion list, which shall contain the names of all promotion list officers except officers of the Air Corps, the several Corps of the Medical Department, and Chaplains. There is a separate promotion list for officers of the Medical Corps, the Dental Corps, the Veterinary Corps, the Medical Service Corps, and a Chaplains' promotion list. Air Corps officers will likewise be carried on a separate promotion list.

We shall now discuss the provisions applicable to each of several promotion lists. First, the Army or line officer list. The line officer is appointed in the Regular Army as a second lieutenant and serves three years in that grade, and four years as a first lieutenant. Thus, if found qualified, he is a captain on completing seven years' service and subsequently, if qualified, is promoted to major and lieutenant colonel, respectively, on completing fourteen, and twenty-one years of total actual service.

The Medical Corps officer enters the Army as first lieutenant and, if qualified, shall be promoted to captain, major, and lieutenant colonel, respectively, on completing three, ten, and seventeen years of actual service.

Officers of the Dental Corps, Chaplains Corps, and Judge Advocate General's Department are appointed in the Army in the grade of first lieutenant and, if qualified, shall be promoted to captain, major, and lieutenant colonel, respectively, on the completion of four, eleven, and eighteen years of actual service.

The officer of the Veterinary Corps will be appointed in the grade of second lieutenant, serving one year in that grade prior



Graph 2—Service years for promotion under "Officer Personnel Act, 1947."

to becoming a first lieutenant, in which latter grade four years must be served. He shall then, if qualified, be promoted to captain. He becomes a major and lieutenant colonel, respectively, on completing twelve and nineteen years of actual service, if qualified for promotion.

After June 30, 1949, the Act provides that officers must have completed one year's service in the grade of lieutenant colonel before being nominated or appointed in the grade of colonel Regular Army. I might add the number of colonels is limited to 8 per cent of the total officers authorized in each of the several promotion lists.

With reference to the grade of general officers in the Medical Corps, the bill as originally introduced provided for the num-

ber as 0.75 per cent of the active commissioned strength of the Regular Army Medical Corps, 1 officer in the grade of major general for the Dental Corps, and none was provided for the Veterinary Corps.

One amendment to the Act made by the Congress provides the Veterinary Corps would be authorized 1 general officer. For the first time in history, therefore, there is authorized the permanent grade of brigadier general for the Veterinary Corps, Regular Army.

The new schedule of promotion having been explained, I will proceed to a brief explanation of the basis or reasons for the plan. The War Department deemed a new plan or system of promotion should be enacted to meet the following objectives: to produce an adequate number of officers of proper ages to meet the needs of the Army, and in the proper grades; to provide a sufficiently attractive career so that men of high caliber will be attracted to the Army as a career; to advance outstanding officers to high grade at the peak of their effectiveness; to eliminate the weak officer as early in his career as possible; and to give equal long-range opportunity for all officers, regardless of occupation.

To accomplish these objectives the Act provides for:

First, a definite number of officers in each grade in each promotion list, and promotion is authorized to keep these grades filled.

Second, assurance that outstanding officers can advance to the higher grades through the system of selection, beginning with the grade of captain and through a steady and forced attrition in the higher grades.

Third, reduction of the maximum time served in grade. (This does not pertain in certain grades as it affects the Veterinary Corps).

Fourth, elimination of officers from active service who are not considered good enough.

Fifth, officers of the Medical Department and Chaplains are put on the same schedule as that of the line of the Army, and the single list is retained for the line officer, to assure all officers the same long-range promotion opportunity.

Thus, it is apparent the Act provides for the selection of officers prior to promotion, rather than automatic promotion based on seniority and/or time in grade; for the elimination of officers from the Army not considered qualified for promotion; for putting officers in the same grades at the same average ages; and, in general, for giving all officers the same general opportunity for promotion.

In developing the bill, much study was given by the War Department committee to the problem of constructive service credit for the professional branches, that is, the physicians, the dentists, the chaplains, the lawyers, and the veterinarians. The question was how much constructive service credit should be given to members of the professional branches for the extra time spent in school beyond that required for a man who could quality for a commission as a line officer. It is assumed the line officer must have the equivalent of four years in college to be appointed. The constructive service credit given the Medical Department and to other professional branches is based on the amount of preprofessional college training required. Also, the average age at time of entrance into the Army of individuals in the professional branches was a factor considered.

A study was made of the average age officers entered the Army during the twenty-year period from 1926 to 1946. For the line officer this was approximately twenty-five years; the medical officer twenty-eight years, five months; the dental officer twenty-eight years, one month; and the veterinary officer twenty-six years, four months. Briefly, the principal factor in arriving at constructive service credit for each professional branch was the minimum length of time from high school that is required for a person to complete his professional education and training until he can be appointed in the Army.

Relative to the constructive service credit allowed the Veterinary Corps in this act, strong protests, arguments, and pleas submitted by the speaker, and actively supported by the then Surgeon General, prior to submission of the bill in final draft to Congress, ultimately failed to gain removal of the requirement that veterinary officers enter the Army as second lieutenants. The entering grade of first lieutenant was the main objective in all discussions. Words cannot express my regret that the major objective was not attained.

I would be remiss at this time not to mention the intense and active interest taken by the AVMA, the various state veterinary associations, the American Veterinary Deans' Association, and by individual members in their efforts to obtain corrective action pertaining to the Army legisla-

tion as it affected the veterinary profession. By request of the AVMA and the American Veterinary Deans' Association, representatives of each were afforded an opportunity to appear before the Subcommittee No. 1, Personnel of the Committee on Armed Services, House of Representatives, Washington, D. C. Dr. William A. Hagan represented the president of the American Veterinary Deans' Association, Dr. R. R. Dykstra, and also appeared as president-elect and member of the Board of Governors of the AVMA. Dr. John Hardenbergh appeared in his capacity as executive secretary of the AVMA. These two gentlemen filed a statement prepared by them for insertion as part of the Subcommittee's record of the hearings and, in addition, each testified in person objecting to the undesirable features of the bill relating to the veterinarian.

The Hon. George W. Gillie, member of Congress for over ten years, and a veterinarian since 1908, also testified before the Subcommittee in opposition to the bill as it affected the veterinary service. Dr. R. R. Dykstra, president of the American Veterinary Deans' Association, filed a telegraphic report with the Subcommittee with a request it be made a part of their record, which, after reading by the chairman of the Subcommittee, was entered as part of the record.

I am informed that many individuals such as Deans Bergman, Newsom, Krill, and others took an active part in the effort of the veterinary profession to have the objectionable features of the proposed act amended.

In closing, I want to express my sincere appreciation for the active interest and support given by the AVMA, the state veterinary medical associations, the American Veterinary Deans' Association, and by individual members during the past year.



—Canadian Pacific Railway

Bow River at Banff is a perfect illustration of the beauty and grandeur of the Canadian Rockies. Banff is another famous attraction on the itinerary of the 1948 AVMA convention tour.

Symposium on Ethics and Business Methods

At the Cincinnati Session of the Association, the following symposium was conducted in the Section on Small Animals. The members of the panel were Dr. Raymond C. Snyder, Upper Darby, Pa., moderator; Dr. A. R. Theobald, Cincinnati, Ohio; Dr. Gerry B. Schnelle, Boston, Mass.; Dr. J. R. Currey, Washington, D. C.; and Dr. Charles Rife, Atlanta, Ga.

Telephone Directory Advertising

RAYMOND C. SNYDER, V.M.D.
Upper Darby, Pennsylvania

To discuss the subject of advertising by veterinarians in the classified sections of telephone directories in the space of ten minutes would be impossible, but as that is the assignment, the highlights will be attempted.

Throughout the length and breadth of these United States there is a flagrant violation of ethical advertising on the part of members of state and national veterinary associations. These violations are the results of complete failure on the part of our groups to enforce or even appoint a committee for the enforcement of the Code of Ethics which they themselves constructed and adopted with the Constitution and By-Laws.

Granted that every member is slightly familiar with our Code of Ethics, which, by the way, the Special Committee on the Enforcement of the Code of Ethics believes to be the best veterinary code in the country and should be adopted by all component organizations, let us point out some of the violations.

The most frequent violation is placing the name of the doctor or his hospital in bold type. This violates paragraph 11 of our Code.

The next most frequent violation is the placing of block listings. This type of advertising may run anywhere from a blocking off of the doctor's name and address which might include about two directory lines to a 3/4-page advertisement like those seen in the directories of our large eastern and western cities. This is unethical.

We now come to the wide variations encountered in veterinary advertising which are direct violations of that portion of our code which states: "A member who . . . advertises his name or hospital or institution in any way differing from the standard style . . . used in the directory for the listing of professional groups (physicians, dentists, lawyers, nurses) is subject to the charge of unprofessional conduct."

Did you ever see an ethical physician publicize in the telephone directory the fact that he takes x-rays of his patients? You may see this form of advertising by veterinarians in most large cities.

Did you ever see an ethical physician list himself in the telephone directory as a specialist? You may see many veterinary specialists in the classified sections of directories. They wouldn't stoop so low as to insert an ethical statement that they limit their practice to small or large animals. No, they must place an unethical advertisement stating that they are specialists in some field of veterinary science, thus giving the impression that they have received additional training in this veterinary work and so are better qualified than their colleagues. The AVMA does not recognize at this time, as far as we are able to find out, specialty fields due to postgraduate work that permit a veterinarian to advertise himself as a specialist.

Did you ever see an ethical physician or dentist insert in the classified section of a telephone directory the fact that he was a member of a leading medical school faculty for ten or fifteen years? You could find such an advertisement under a veterinary listing, for we have such a copy in our possession. This is unethical.

Ethically, you may not list the fact that you are a member of the AVMA in the telephone directory. Yet we can show where a veterinarian lists the fact that he is a member of the AVMA and the AAHA in his telephone directory, the fact that he employs a woman nurse, and that although it may be farther to his hospital, "it's much better for your little pet." He may believe these latter things, but in print they are unethical and belittling to the veterinary profession.

Under veterinary listings, we have pictures of dogs and cats, healthy and sick

ones; some wearing bandages, others on crutches; animals chasing each other up and down trees; or as seen on veterinary signs, wagging their tails to attract attention and bring money into the coffers of some veterinarian. Have you ever seen anything in human medicine or dentistry to compare with this type of veterinary advertising? It is all unethical.

Plucking, bathing, and boarding are not actually a portion of veterinary small animal medicine. The performance of these services by veterinarians as a side issue of their practice is not frowned upon by the profession. But the advertising of these services in conjunction with professional listings in telephone directories or even on professional cards is considered unethical. However, from some listings it would seem that boarding and bathing were the entire practice of veterinary medicine due to the prominence they receive in the advertising of veterinarians. It is high time that these nonprofessional services be removed from all professional advertising.

The next unethical procedure which comes to mind will be called, for the lack of a better name, "first listing." Here we have a veterinarian whose name begins with a letter which would automatically place him well down in the list of doctors in the classified section of the directory. He therefore chooses a fictitious name for his practice or hospital which begins with the letter A, like "All Animal Hospital" or "A.A.A. Hospital," thus bringing his listing to the top of the directory names, where he feels he will be seen more readily and make more money. Some may say that this is not unethical as long as he registers his name with the authorities under the fictitious name act. The fact that he registers the fictitious name does not alter the principle behind the move. Again, this type of advertising is considered unethical and must be discontinued. To quote from our Code again, consider paragraph 13, "In principle, this section of the Code is intended to improve the listing of names in such a way as to give all of them identical visual prominence."

In closing, and for the sake of making an even number of ten violations mentioned, we would like to bring out the advertising of veterinarians of "24-hour service." This might be well for garages and gasoline stations to advertise, but it is contrary to our Code, and it will be a long time before one finds a physician or dentist placing such a listing in a directory.

Our profession falls well below other branches of medical science when it comes to professional advertising, and we should be ashamed of ourselves as it now stands. However, with the will to clean our own house and the spirit of coöperation on the part of every member of the national, local, and state veterinary medical associations, and their officers, we can, with the constructive program already begun by the Special Committee for the Enforcement of the Code of Ethics, place the veterinary profession on the same plane as our related professions in all branches of professional advertising. Will you do your share?

Ambulance Service

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The operation of a small animal hospital is a business, even though the veterinarian's work is professional. Ambulance service is one item that must be considered from the business and professional angles. Is it a good business, and does it, as usually conducted, elevate the standards of the profession? These are the questions that arise.

I have written a large number of owners of small animal hospitals in various parts of the country. From their replies have been gathered many of the ideas I am presenting, as I do not own an ambulance and cannot speak from experience. I learned that many of these men once offered ambulance service but sooner or later discontinued it. All thought it lost money and some few thought it lost practice as well. Another objection was that clients disliked pet ambulances stopping at their homes and attracting the attention of the neighbors. The following are direct quotations from two of the men who disposed of their ambulances. One said: "Pick-up and delivery service on dogs and cats caused us more work, more worry, and more grief than anything we have ever done." The other stated: "I had an ambulance years ago. That was enough for me. I believe I kept it two years, and that was the end."

The initial cost of the ambulance is a big item, but in addition one must take into consideration depreciation, salary of driver (whether he devotes full time or part

time), costs of fuel, repair, license plates, garage rent, chauffeur's license, city permits, insurance costs, which should cover protection against bodily injury and property damage, fire, theft, wind, collision, injury to animal, or loss of an escaped animal. These latter two items are especially expensive because of the hazards involved.

When all is considered, the total operating costs seem to me to be out of proportion to the additional business that may be obtained. There seem to be a few who believe the operating expense does justify the service, but I noted that most of these men had other uses for the ambulance than the strictly emergency service for which an ambulance is intended. Then, too, in order to secure sufficient volume, the use of an ambulance in some cases gradually comes to include boarder and bather service. If a hospital has one or more branch offices, an ambulance probably could prove useful enough to justify the operating expense, but it is extremely doubtful if any single hospital has sufficient need, and can afford the expense, to properly man and operate an ambulance.

In respect to fees, there can be some very unethical practices, especially if no fee at all is charged! It is my opinion, shared by many other veterinarians, that anyone giving free ambulance service is guilty of unfair competition to those who have ambulances as well as to those who have not.

There is some question as to whether or not it is ethical to advertise an ambulance in the telephone book. It certainly is unethical if it offers a pick-up and delivery service. Newspaper write-ups with pictures of ambulances are to be criticized as in bad taste. When a write-up distorts the facts as to equipment and facilities of an ambulance, great harm can be done to the profession as well as to the individual owner, for the public will soon know if such an ambulance is just a dog cage on wheels.

I know a few men who do conduct an ethical ambulance service that is not for advertising purposes but, by and large, up to this time the primary purpose of the ambulance seems to have been to advertise the hospital. One veterinarian told me that when he worked as an assistant it fell to his lot during business lulls to drive the ambulance through the better residential sections (in a big hurry) to influence the right people. Some years ago, in an eastern city, a new hospital was introduced to the public by means of an ambulance with a loudly ringing bell that was driven for three days over all the streets. It took special legislation of the city council to stop the noise, and after that the law specified that only an ambulance for human beings could have a bell or siren.

In the early days of small animal practice, most of the service was rendered in the home. Veterinarians have recognized, and pet owners have gradually learned, that better service is offered in the office and hospital. The result has been that more and more veterinarians have discontinued house calls. I think it will be admitted that most owners are willing to transport their pets in their own cars or employ taxis; yet, the need may arise for emergency calls to the home to bring injured and seriously sick patients to the hospital. Since these calls for resident service can be limited to but few emergencies, it becomes more economical to use an ordinary automobile.

The idea of a pet ambulance may be all right, but if the small animal hospital is to operate one I should like to see the service patterned somewhat after the type of service rendered by ambulances for human beings. Always there is someone in the ambulance who is qualified to give the needed service on the scene, or to assist in the handling of the patient en route to the hospital. Too few pet ambulances have more than a driver on emergency calls.

In any event, whether an ordinary car or an ambulance is used, every effort should be made to keep the patient comfortable and to protect the injured patient from additional injury. It is the observation of some that there is need for improvement in the handling of patients en route to the animal hospital. Perhaps the solution to the problem will some day be through a private enterprise that will provide ambulance service for all the pet hospitals of the community.

In conclusion I wish to say that I for one would like to see the Special Committee on Enforcement of the Code of Ethics examine the subject of ambulances and ambulance service from the standpoint of unethical practices, advertising, and unfair competition, and, from the results of their findings, develop a policy that may be incorporated in the Code of Ethics of veterinary practice.

The Ethics of Referred Practice

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The greater division of the practice of veterinary medicine into specialties and the advancements in technique, particularly surgical, orthopedic, and radiographic, must increasingly widen the gap between possibilities of diagnosis and treatment by the general practitioner and by the competent and well-trained specialist. Therefore, if the rights of the patient and owner are paramount, and they should be, unquestionably, then there must be a greater tendency among veterinarians to refer patients. To fail to do so because of pride or egotism is unintelligent and inexcusable; to fail to refer patients because of pecuniary interests is not only being false to one's profession but actually may constitute malpractice.

In the Code of Ethics of the AVMA, paragraph 7 is concerned with consultations but seems both ambiguous and less concerned with the rights of the patient and owner than with those of the attendant veterinarian. In addition, the section is obviously written to apply to farm or stable practice rather than to the small animal specialty in which animal and client travel to the veterinarian or his hospital.

An examination of the codes of ethics and conduct of physicians and surgeons discloses little that is precise, except that part which relates to fees. It would be well, however, for the veterinarian to study the fellowship pledge of The American College of Surgeons which says, "The welfare of the patient must be placed above all else. I pledge myself . . . to advance constantly in knowledge by the study of surgical literature, the instruction of eminent teachers, interchange of opinion among associates, and attendance on the important societies and clinics; to regard scrupulously the interest of my professional brothers, and seek their counsel when in doubt of my own judgment." It further states, "Upon my honor I hereby declare that I will not practice the division of fees, either directly or indirectly in any manner whatsoever."

The veterinarian who "has built a better mouse trap" will find thrust upon him on numerous occasions medical and surgical cases in which another veterinarian has been, or is, concerned. Such situations may arise when an animal is sent by the attendant veterinarian for consultation. They may also arise when the client takes his animal, with or without the attendant veterinarian's knowledge, to a second veterinarian either for confirmation of the opinion expressed by the first or because he is frankly dissatisfied with the treatment being given. In instances in which the situation can truly be called a consultation, that is, the first veterinarian has suggested that the client take the animal to a colleague for help in diagnosis and/or treatment, no contingency arises if the consultant feels that the diagnosis is correct and treatment is approximately adequate for the disease condition which prevails.

The consultant will have fulfilled his duty to all if he voices his opinion to the client and to the veterinarian, and the latter should be accomplished as quickly as possible.

The situation is a bit different if the consultant feels that the diagnosis and treatment were neither correct nor adequate, and it is quite a bit different if he feels that treatment was grossly inadequate. It is our experience that such situations as the latter rarely or never arise in the truly referred patient, but they do arise with animals which have been seen by other veterinarians. Perhaps these circumstances occur more frequently in Massachusetts because it has been the home state of a veterinary diploma mill. Should not the veterinarian, too, adhere to the surgeon's pledge that, "The welfare of the patient must be placed above all else?"

Line "d", paragraph 7, (AVMA Code of Ethics) states, "Consultants shall not revisit the patient or client or communicate directly with the client without the knowledge of the attendant veterinarian," and line "f" says, "In no instance and under no circumstances shall a consultant take charge of a case or problem without the consent of all concerned. . . ." Certainly many of us often face situations in which a referred client prefers, without reservations, that the patient shall stay in the consultant's hospital. It seems to me that the only rules which can cover such a contingency are (1) "The welfare of the patient must be placed above all else," and (2) "Do unto others as you would have others do unto you." If more veterinarians were to follow the American College of Surgeons' pledge heretofore mentioned, "To ad-

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vance constantly in knowledge by the study of surgical [or medical] literature, etc.," fewer situations would arise in which the diagnosis and treatment of one could be so freely and justly criticized by another.

Last month a physician of excellent repute came to us from a nearby Massachusetts city with this request, delivered abruptly but with no apparent rancor: "Please advise me of a good book which I might obtain on the diagnosis of canine disease. .I have just been through an expensive experience with my dog which left me little confidence in our local veterinarians." Briefly, his story was that three veterinarians had seen the dog. He did not question their diagnoses but their examinations of the animal had been most casual—their prescribed treatments seemed not in keeping with modern knowledge of therapy, and when the last attending veterinarian prescribed *one* penicillin tablet, by mouth, per day, then he became convinced, and rightly so, that this man was not informed on medicine. What course would you have a consultant take in such an event? Beyond blushing for the veterinarian in question and for the profession, there is little that one can do to correct this kind of situation. There is nothing to be gained by being critical, since the facts of the case are so obvious that they speak for themselves. Veterinarians, and doctors too, may lapse into the dangerous channel of relying upon time and nature to effect the recovery in disease and, with entire disregard of medical knowledge, throw in an occasional dose of penicillin or sulfa drug. The client may himself be sufficiently well informed to know that professional quackery is being perpetrated. What is perhaps more commonly true, the next veterinarian on the case, who changes treatment to what it should be, may have to explain his reasoning. How far would you have him go to "cover up" a colleague?

In our particular instance, some veterinarians seem to feel that there should be a special discount when they bring or send patients to us for advice, especially for diagnosis and suggested treatment. It seems anomalous that in such instances the attendant veterinarian should consider the patient as chattel and a candidate for free or discounted services. A physician or surgeon would certainly not take John Smith by the hand to a consultant surgeon, have an appendectomy performed, and then ask the surgeon for a discount of his fee. By whatever name one would choose to call such practice, it is still fee splitting and cannot be condoned for veterinarians any more than for physicians. The patient certainly must be an entity; for example, Bruce, Cocker Spaniel, male, aged 2 years, property of Mrs. John Smith of Center St., etc. An attendant veterinarian who expects that his client's animal should be treated as the veterinarian's own and for a discounted fee is very definitely being unjust to the consultant.

In preparing this material, a local surgeon of nationwide repute was consulted for an opinion on the following situation. An animal is presented to the consultant by its owner, with or without the expressed agreement of the attendant veterinarian. Upon receiving an opinion, the owner decides to leave the animal for medical or surgical care with the consultant. What to do? The surgeon's opinion was somewhat as follows: If the patient (client) is over 21 and of sound mind, he may consult whom he wishes and engage whom he wishes and it should not be the intent of medical ethics to *force* the consulted veterinarian to return the client against his own wishes to the referring or previously employed veterinarian.

SUMMARY

This short paper is intended to emphasize several thoughts, namely:

1) Self-improvement by the veterinarian of his professional knowledge.

2) The ever important point that the rights of the patient (client) are primary.

3) That a set of rules of ethics are less needed than gentlemanly conduct. It is also proper to emphasize that authors, lecturers, and editors have a grave responsibility in offering to veterinarians therapy which has not a good scientific and proved basis.

Accounting Systems for Veterinary Hospitals

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An accounting system, broadly considered, is the means through which management understands, controls, and directs the operation of a business.

Obviously, any presentation to cover title concepts should be delivered by a certified

public accountant having specialized knowledge and experience in hospital management.

Good business records are equally as important and as essential as complete clinical data in conducting an efficient veterinary organization. Guess work and poor records conversely exact severe and irremedial penalities. Veterinary hospitals without systematized controls are not heeding fundamental requisites of self preservation and are surely courting difficulties.

To supply the busy veterinarian with comprehensive data on hospital operation, and at the same time provide for the increasing demands of state and federal governments with the information they usually request, necessitates considerable thought before the installation of any system. The logical system should be simple, sufficiently versatile to allow not only for the usual flexible demands but also to supply all the veterinarian's needs with efficiency and dispatch—with no duplication of effort or cost.

It should be remembered that, while an individualized accounting system should be the key to positive control, under competent direction it can still be streamlined and effective.

Broadly speaking, the major purpose of an accounting system may be said to fall into three basic classifications, namely:

1) To record business transactions
2) To safeguard assets
3) To control operations

Recording Business Transactions.—The first essential of an accounting system is that it provide for business transactions to be recorded accurately and promptly. This requirement is basic. Without adequate recording there would be no means with which to carry out the other major purposes of the system.

Many individuals have been led to believe that the installation of a few mechanical contraptions and the redesigning of a few forms constitute an efficient system. Dissatisfaction often results. In recording transactions, the procedure should be adequate, but it also should be direct and explicit. Errors and attendant waste of time are common with complicated procedures. The system should permit recording in sufficient detail, with minimum cost. It should record today's transactions for tomorrow's guidance.

Safeguarding Assets. — With human frailty what it is, and with the possibility of fraud and deceit, it is always prudent to take steps for prevention and detection. Carelessness and incompetence often cause results similar in effect to outright dishonesty. Safeguards against such tendencies are always needed.

Cash, because of its ready negotiability and lack of identifying characteristics, is the one business asset most often subject to improper designs. Accordingly, it is the one that requires the most vigilant safeguard. The operation of internal checks should be unfailing and as nearly automatic as possible.

Controls of Operations.—Efficient managerial control cannot be obtained without an adequate accounting system. The two previous functions, the recording of transactions and the safeguarding of assets, are mechanical, while the control of operations is more evasive and intangible, yet in several respects most important. Herein a versatile accounting system can achieve intelligent control.

Increasing business volume will be wasted effort if attended by disproportionately mounting overhead costs. It is the net operating profit resulting from the veterinarian's efforts that is most important, and to derive the maximum profit from each department requires a vigilant and tight-fisted control.

A well-designed and balanced accounting system will provide a flexible breakdown and analysis of all hospital operations. These departmental breakdowns should supply the veterinarian with vital information to serve as a guide in formulating future policy, a purpose of utmost significance.

Without effective and vigilant control, rising costs can totally obliterate the profit margin. Conversely, certain apparently productive units may be found to be operating at a deficit.

Prior to this meeting, a short questionnaire was mailed to key veterinarians of different localities requesting information relative to their present choice in clinical and financial records. As expected, there were considerable variations in their methods of supplying information for their records and transferring same to ledgers.

A cross section of those replies indicated that about half were satisfied with the efficiency of their present systems, while the

remainder felt a definite need for improvement.

Many of the veterinarians had installed, and were using, satisfactory systems or forms that were designed and sold by firms specializing in professional records. Ordinarily, a system of this type, while adequate for a physician or dentist, would not be sufficiently flexible or versatile to accommodate the average needs of a veterinary hospital.

We have used several of these systems over a period of years but for various reasons have discarded them. Our present system was set up by a certified public accountant and has worked out most satisfactorily.

I had intended to set up a composite exhibit of clinical and business record cards, but the returns received from the above mentioned questionnaire would not merit such. In lieu of this, I will attempt rather briefly to outline the essential features of our present system.

Each client has a clinical and a financial record card of equal size (6 x 8 in.) but of different color for easy identification. The clinical record is printed to order and contains not only the space for the usual information on similar forms but space for repeated office or hospital services.

This card is taken to the examination rooms and pertinent information, medicine dispensed, etc. is noted hereon. The charges are placed in code in the designated space. This procedure renders it impossible for the client to summarize past charges.

The charges are then transcribed to the financial record in the office. The financial record card is a standard business form and never leaves the office file. This prevents the loss or damage to a very important record. Should the clinical record be mislaid or damaged, a recap could easily be made from the financial card. Should the indebtedness cover hospitalization, the daily hospital chart would supply the missing information.

Upon completion of a cash transaction, a duplicate receipt is made. The financial record is checked with these receipts at the end of the business day. At this time, the charges for each client are recorded on a ledger sheet and balanced.

The daily ledger or summary sheet is broken down into the following categories: services, surgery, hospitalization, misc., total charges, and payments received on account. All of these totals are then transferred to a monthly ledger sheet, and a daily bank deposit is made up. From this point, the accountant utilizes these figures to prepare his monthly comparative statement of income and expenses. The expenditures are taken directly from the check book stubs and placed under the usual expense breakdown classifications.

The personally gratifying feature of this monthly comparative statement is the cumulative totals under each classification, not only for the current fiscal month and period but also the comparative totals for the same period of the previous year. With the comparative figures of several years available, the exact status of income and expenditures can be checked very closely.

This system may sound complicated with this rather sketchy description, but I can assure you it really requires the minimum in effort and time, and it certainly does not require the services of a specialist.

In conclusion, from a well-designed accounting system we can expect to furnish vital information, not only to the hospital owner, partners, or associates with individual or joint financial monthly statements but also those departmental cost breakdowns in which we are always vitally interested. Over a period, this system will emphasize seasonal trends with fluctuations. This knowledge can often become an asset and an aid in formulating future policy. The system can provide information to supply comparative periodic statements covering present and past fiscal periods. This can be the crux of our *modus operandi* and indicate progression or stagnation.

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Costs of Operating a Hospital in Relationship to Fees Charged

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In the brief discussion of this topic, the operating costs are compared to the fees charged for rendering veterinary services in a small animal hospital. The period considered is 1929 to 1947. In this study, we will note how the increase in operating costs affects the percentage of net profit, even though fees have been increased.

The statistics in this paper were gathered from all sections of the country. The hospitals chosen were those that employ one or more veterinarians beside the owner, plus lay help. By approching the problem from this point of view, labor, both professional and lay, can be more effectively studied, as labor is the largest single item in the operating cost.

Assistant Veterinarian's Salary—In 1929 and through the depression, it was not hard to secure a graduate veterinarian for a salary of $125 to $150 per month. Today the minimum starting salary is not less than $250 per month in the experience of the men to whom I have talked and my own as well. From the computations made from the returned questionnaires I found that the overall increase in salaries for assistant veterinarians, both junior and senior, averages 98 per cent from 1929 to 1933. May I clarify junior and senior veterinarians? Juniors are those who are just employed and serving in the capacity of interns. The seniors are those who have served their internship and are experienced.

As you know, the scarcity of veterinarians and their services in the Armed Forces, previous to and during the war, put a premium on them, especially those who did not come under Procurement and Assignment. Since the war, many of these young veterinarians have entered practice. The governmental services are attractive and many young graduates enter this work, due to the good pay and the shorter hours.

Lay Help Salaries.—In the field of lay help, there has been a tremendous increase in salaries. One prominent small animal practitioner had an increase in his rate of salaries of 225 per cent; another 166 per cent. My percentage of increase was 125. The overall average for lay help as computed from all questionnaires was 72 per cent. This percentage is figured on the salary of an individual and not on an increase in additional men added to the payroll. Skilled mechanics have more than doubled their scale since 1929, and many operators of hospitals have much more than doubled the rate of pay. Is this not true, because back in the WPA days, unskilled labor was not in demand, and wages or salaries were low? With living costs in the country up 116 to 130 per cent since 1929, it has been necessary to increase the pay of lay help, even though they are not trained and qualified to do the work asked of them.

The next large increase on the expenditure side of the ledger is in the field of drugs, biological products, and hospital supplies. A list was obtained from one of the largest manufacturers of veterinary drugs, biological products, and instruments for a cross section study in costs of drugs, etc. It was found that since 1929 there has been an increase of 61 per cent in the price of serum and biological products; standard drugs (nonspecialties) 35 per cent increase; supplies 49 per cent; giving an overall increase in price of 44 per cent. It is true that during the war prices were frozen by the OPA. With the demise of the OPA, the manufacturers have raised the prices of many drugs and have discontinued the 10 per cent trade discount. This is as it should be, due to the increased cost of manufacture. When sulfa drugs and pencillin first came on the market, they were high priced and hard to get. Today, they are relatively cheap and the veterinarian need not charge a large fee for their use, as he previously did. However, many non-specialties have remained the same in cost, except for the 10 per cent increase due to the discontinuance of the trade discount.

Other items of expenditure in the operation of a veterinary hospital were not studied because many of them have local aspects, such as rent, taxes, water, electricity, and telephone rates. The price of the various kinds of fuel used by veterinarians varies over the country, due to freight rates, etc. However, practically all of these items show a marked increase in cost.

Revenue.—On the revenue side of the ledger, what is the picture? Our income as veterinarians is derived from hospitalization of animals for medical treatment and from specific services rendered, such as surgery. From the questionnaires, I gathered that the daily hospital rates for the group have averaged an increase of 53 per cent. The highest individual increase was 67 per cent; the lowest 33 per cent.

In the field of surgery, most veterinarians have increased their fees, which is justified in the light of increased costs of operation. The average increase for the group is approximately 40 per cent. The increase of one practitioner was 75 per cent. Another prominent veterinarian stated that he had increased his fees for

surgery but did not make as much net profit as previously, due to the improved methods he now uses, such as intratracheal anesthesia and intravenous therapy.

As previously stated, with the advent of penicillin the fees for administering it were higher than today, due to the high purchase price. The question of immunologic agents and the fees for administering them have been determined more or less by the community in which one lives; for example, rabies vaccination.

In answer to the question "Have you retained the same relationship of net profit in the operation of your hospital as you did in 1929 to 1933?" all but one veterinarian replied "no." On the basis of the averages of the figures given by those polled, there is a loss of nearly 25 per cent of net profit. Volume of business has not entered into the compiling of these percentages.

CONCLUSION

1) In making this study, only three main items of expenditure were considered; salaries for assistant veterinarians, salaries for lay help, and costs of drugs, biological products, and hospital supplies.

2) The average increase of veterinarians' salaries was 98 per cent; lay help an increase of 72 per cent; drugs, biological products, and hospital supplies, an increase of 44 per cent.

3) Fees for hospitalizing dogs showed an increase of 53 per cent.

4) Fees for surgery increased approximately 40 per cent.

5) Of the veterinarians polled, only one is maintaining the same relationship of net profit from fees charged in 1947, as he did in 1929 to 1933.

6) It should not be inferred from this study that veterinarians are not making as much money now as they did previously, for volume of business is not included in the picture as presented here.

7) The pet-owning public, by and large, are not the class of people that have had a great increase in their salaries but, in the main, belong to the white collar class. Therefore, it is not possible to increase fees to the advanced level of salaries and other commodities in general.

Due to lack of time before adjournment of the Section, Dr. Charles Rife did not read his paper as scheduled when the panel was presented. For the same reason, no discussion from the floor was possible.

Laboratory Workers Contract Q Fever

Although Q fever was introduced as an infectious disease of man contracted by exposure to livestock, an explosive outbreak of that rickettsial infection (*Rickettsia diaporica* and *burneti*) involving 47 workers of the National Institute of Health occurred in the spring of 1946 (*Ann. Int. Med.*, July, 1947: 27-28), independent of any demonstrable contact with animals. The period of incubation was twelve to twenty-three days and the prodromal symptoms of headache, malaise, and aching lasted one day. The severity varied greatly from mild ambulatory cases to grave lobar pneumonia (13 cases), followed by lingering convalescence. The diagnosis was confirmed by approved serologic and bacteriologic methods.—*Abstr. Am. Rev. Tuberc., November, 1947: 147.*

Wash Linen in Private—Brucellosis

Said J. A. Barger before the AVMA at Cincinnati: "Sometimes veterinarians write articles for farm papers and other journals in which they outline how far the states have drifted from any logical program for the control of brucellosis. Only recently such an article was brought to my attention. In it, the veterinarian severely criticized the program of several states and set down what in his mind was the logical course to pursue. Even though he might be right and the official programs wrong, would it not have been better for the veterinarians to wash their linen in private? I wonder if these men realize how long some veterinarians have been striving to improve social and professional standards. I wonder if we have been properly indoctrinated into our own profession."

And so on ad infinitum.—Dr. James Hillier, of the Radio Corporation of America, reported to the Electron Microscope Society of America at Philadelphia last month that he had seen tadpole-like creatures "with skinny tails and bodies" penetrating the cell walls of bacteria. Size: one four-hundred-millionth of an inch in diameter. They file in until they fill the whole cell, the report says.

James Law's contention that vaccination never eradicated an infectious disease, human or animal, still remains unchallenged.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Sterility in Swine

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REPRODUCTIVE disturbances of cattle have received considerable attention with the result that figures on incidence, methods of prevention, control, and therapeutic measures have been made available. Breeding efficiency records in herds of normal cattle are known and thus evaluation of infertility is relatively easy. Since swine produce a number of offspring at one time, estimations of fertility are more difficult to make. Complete sterility in swine is apparently of less frequent occurrence than in cattle, but lowered fertility is known to occur.

Reproductive failures in swine may be due to various factors. Most of the available information serves primarily to accentuate the extent of the problem in swine, but few specific therapeutic measures for the correction of infertility have been described. It should be pointed out that certain defects in reproduction have a hereditary background and therefore are not amenable to therapeutic measures. In fact many times treatment of infertility in individual swine is of doubtful economic value. When infertility is encountered as a herd problem in swine, the veterinarian should endeavor to ascertain the fundamental cause or causes of such reproductive failure and should attempt measures to prevent or control the problem. This paper is written in an attempt to compile partially the pertinent work that has been published on sterility in swine and to present the author's experiences with infertility associated with Brucella infection.

Presented before the Section on Surgery and Obstetrics, Eighty-fourth Annual Meeting, American Veterinary Medical Association, Cincinnati, Ohio, Aug. 18-21, 1947.

Contribution from the Department of Veterinary Science, Journal Paper No. 308, Purdue University Agricultural Experiment Station, Lafayette, Ind.

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Reproductive failures may result from (1) inability or reduced ability to produce ova or spermatozoa, (2) lack of sexual desire, (3) death of ova or spermatozoa prior to fertilization, (4) lack of implantation of fertilized ova in the uterus, (5) arrested or abnormal fetal development, abortion, or fetal resorption, and (6) stillborn pigs at normal term. The incidence of these various causes of infertility are not completely known, so far as recorded literature is concerned.

Phillips and Zeller[1] reported that conception failures in 1,354 breeding seasons in six breeds ranged from 13.9 per cent in the Duroc to 36.9 in the Tamworth. They also observed differences in number of services required per pregnancy and in litter size between breeds. Their conclusions concerning the relative importance of points at which the reproductive process failed, as indicated by estimations of the percentage of ova lost are as follows: "(a) failure of conception, 36.4 per cent, (b) loss from conception to parturition, 19.9 per cent, (c) loss from parturition to weaning, 14.6 per cent, and (d) loss at parturition, 2 per cent. This leaves 27.1 per cent of the ova which have the chance to be fertilized represented by live pigs at weaning."

In studying Yorkshire, Landrace, and hybrid swine, Berge[2] reported, counting several services during the same heat period as one mating, 77.6 pregnancies were obtained per 100 services, with 1.6 per cent abortions. The greatest probability of conception was at the first service. The pregnancy figure was increased at the second service during the same heat with one-half to one day's interval between services. Individual boars exhibited great differences in their ability to impregnate sows.

Phillips[3] reported that of 250 sows se-

lected at random in a herd, 42, or 16.8 per cent, failed to produce litters. Of the remaining 208, 84 per cent required one service, 12 per cent required two servicees, 2.5 per cent required three, and 1.5 per cent required four. Twenty-five of the 42 that failed to produce litters were bred once and the remaining 17 from two to five times.

Studies by Hammond[4] and Corner[5] indicate that about 70 and 67.4 per cent, respectively, of the ova shed by sows develop into normal fetuses. Their results were obtained from slaughtered pregnant sows and hence would include as normal fetuses pigs which might be stillborn.

From these reports it can be seen that complete failure to conceive, incomplete fertilization of ova produced, and early fetal mortality result in a marked reduction of breeding efficiency in swine.

The influence of age at the time of the first gestation, weight changes from breeding to parturition, and the age of sows on fertility is often a subject of much speculation among swine breeders. Krizenecky[6] states that statistical studies on over 400 sows with 1,945 litters show that fertility is highest in sows which have produced their first litters at the age of from 1 year to 16 months. In a later publication,[7] he was unable to show any differences in litter size, weight of pigs in the first litter, pig mortality, or significant effects on the average size of future litters between gilts bred for the first time at 8 to 9 months of age and those younger than 8 months. He concluded that early mating is not necessarily harmful and that selection for early maturity may be made from those gilts which farrow normally after premature mating. Haring[8] and others[9] established that the size of the first, second, and third litters of gilts first bred before 8 months was less than those of gilts bred when older than 8 months. Peak fertility in the former group was reached at the fifth litter, while in the latter group it was reached at the fourth litter.

Concerning weight changes in sows during the gestation and suckling periods, Zeller *et al.*[10] showed that there was a tendency for the number of pigs farrowed to increase with the rate of gain of the sow during gestation. The heavier sows at farrowing had larger litters and weaned more and heavier pigs. This increase in litter weight was accompanied by an increasing loss in the sows' own weight during suckling. From these results, it seems apparent that caution should be used in culling sows from the herd at weaning time, as sows which produce milk readily may be discarded due to thinness and poor appearance. This type of investigation supports the belief that raising the level of fetal nutrition may improve the litter and pig size.

The age of the sow seems to have considerable effect on fertility. Csukas,[11] Fischer,[12] and Zorn *et al.*[13] have shown that litter size rises to a peak at the fifth or sixth litter and then decreases. This points to the advisability of selecting good females and maintaining them through their fifth or sixth pregnancy for maximum reproduction.

The percentage of stillborn pigs usually approaches 5 per cent. McPhee and Zeller[14] reported 497 stillbirths in a total of 8,991 pigs farrowed. These occurred in 259 of 1,121 litters. Large litters of 12 and over showed a high incidence of stillbirths (11.7%), while medium-sized litters averaged 3.9 per cent. The birth weight of stillborn pigs was more variable and significantly higher than normal pigs.

Asdell and Willman[15] reported an incidence of 6.6 per cent stillborn pigs, exclusive of mummified fetuses, in a total of 1,882 pigs born over a five-year period. They associated large litters and old sows with high stillborn numbers. More stillbirths were recorded in spring litters of which many showed iodine deficiency symptoms. Of 127 stillbirths, 8 were attributed to immaturity, 18 to over- or undersized organs, 19 to pathologic conditions, 19 to endocrine disturbances, 5 to deformed skeleton, 13 to birth, and 45 unclassified. Histologic examination of lungs revealed a preponderance with open or partially open alveoli. This finding, coupled with the fact that 9 stillbirths were recorded in the first half of the litters born and 45 in the second half, led the authors to consider suffocation during birth as an important cause of death. It has been observed many times that the number of stillborn pigs increases with the length of parturition. Attempts to hasten parturition with pituitrin by Asdell and Willman[15] gave inconclusive results, although initial success suggests further trials would be valuable.

PHYSIOLOGIC FACTORS

It is rather common knowledge that the sow remains in estrus from one to four days, with two to three as an average. As estrus is reached, from 15 to 40 large follicles are present in the ovaries, nearly all of which rupture at ovulation. Ovulation usually occurs on the second day of estrus with some ovulation taking place on the third day. Thus, from a physiologic point of view, breeding on the second day of estrus seems the most advisable. Some livestock men prefer to breed twice in the same heat period. This should not be necessary since it has been shown by many workers that breeding once twenty-four to thirty-six hours after the onset of heat results in as many pregnancies as breeding at the onset of heat and again later in the heat period.

The time between successive litters or "litter distance" is apparently important since longer intervals result in breeding irregularities. Hofmann[16] states that long intervals between litters result in lowered fertility. Tebbe,[17] Krizenecky,[18] and others have shown that the breeding of suckling sows did not have a deleterious effect on the subsequent litter. Breeding early in the suckling period at the postpartum heat period was not advisable.

It has been repeatedly shown that equine gonadotropin has a marked stimulating effect on ovarian function in the sow. Cole and Hughes[19] have reported that of 10 sows injected with 750 to 1,050 international units of pregnant mares' serum between parturition and the thirtieth day of lactation, only 1 came in heat and she failed to conceive. Of 27 injected between the thirty-ninth and sixty-eighth days of lactation, 26 came in heat three to seven days after injection; 19 of 20 bred became pregnant. Only 1 of 11 controls came in heat during lactation and she did not conceive. The practical aspects of such an experiment should not be overlooked, since indications are that the time between successive farrowings can be shortened by two to four weeks by using equine gonadotropin after the fortieth day of lactation. By this means the farrowing season could be shortened by inducing estrus in the late farrowing sows and breeding the early farrowing sows at the end of lactation. The suckling period could be lengthened, if desirable, and two litters per year could still be produced.

Sexual development in the boar has been studied by Phillips and Zeller.[20] Their report on small and large type Poland China boars indicates that spermatozoa were first observed in the seminiferous tubules at 20 weeks of age and were present in all 79 boars studied by 25 weeks or older. In most cases the left testis was heavier. Van Wyk[21] states that a well-grown boar at 9 months can be allowed one service per week; at 1 year he can serve 20 sows, at 18 months 30, and after 2 years up to 50.

From the author's experience it is evident that very few persons are acquainted with the characteristics of boar semen. In view of this the following summary of an excellent paper by McKenzie, Miller, and Bauguess[22] is presented: (1) Twenty to 40 per cent of fresh semen consists of gelatin-like material. (2) Semen volume for single ejaculates ranges from 125 to 500 cc.; sperm concentration from 25,000 to 1,000,000 per cubic millimeter; total sperm per ejaculate 2.7 billion to more than 300 billion. (3) The ejaculation period can be divided into three to five phases depending on whether there is one or two sperm waves. The first phase lasts one to five minutes, consists of semi-solid material containing no sperm and makes up 5 to 20 per cent of the total ejaculate. The second phase lasts two to five minutes, consists of milky fluid and some gelatin-like material, contains spermatozoa, and comprises 30 to 50 per cent of the total ejaculate. The third phase requires three to eight minutes, consists of a thin watery discharge with a few sperm, and composes 40 to 60 per cent of the ejaculate. (4) The contribution of the accessory sex glands to the total ejaculate are: seminal vesicles 15 to 20 per cent, Cowper's gland 10 to 25 per cent, testes and epididymides 2 to 5 per cent, and prostatic and urethral glands 55 to 70 per cent.

BREEDING PRACTICES

Excessive use of boars both young and old should be carefully considered when breeding failures occur. Lyon[23] criticizes the practice of allowing the boar to run with the sows, when he may perform ten to 12 matings a day with small, weak litters as a result. Rodolfo and Timofeeva[24] stated that two services per day are undesirable since not only is the second ejaculate smaller, but the testes are so exhausted that a prolonged rest is required to restore

normal spermatogenesis. In a later publication, Rodolfo[25] reports that one mating a day is sufficient but that there should be an interval of sexual rest after every two days. More frequent use of the boar is deleterious. McKenzie, Miller, and Bauguess[22] showed that the semen volume remained above 200 cc. when ejaculations occurred at intervals of forty-eight hours or longer, the number of sperm per cubic millimeter remained above 100,000 and the total number of sperm per ejaculate exceeded 20 billion. Furthermore, the number of abnormal sperm did not exceed 100 per 1,000 and the sperm remained motile for five or more days. However, repeated ejaculations at intervals of twenty-four hours or less reduced semen volume below 200 cc., sperm concentration to 15,000 to 50,000 per cubic millimeter, and total number of sperm to 2 to 5 billion. The abnormal sperm increased to more than 200 per 1,000 sperm, and the duration of sperm motility was reduced to one to three days. Sexual desire was temporarily lost in 2 of 3 boars after the third or fourth semen collection at twelve-hour intervals.

Cryptorchism in male swine is definitely an inherited characteristic. McPhee and Buckley[26] claim that most of the evidence on cryptorchism can be accounted for on the basis of a monogenic sex-limited recessive. They showed that in six generations of brother-sister mating there were about 40 cryptorchids, both unilateral and bilateral, out of some 250 boars. (The only certain method of eliminating cryptorchism is by discarding all animals which have been the parents of cryptorchids.)

Williams[27] mentions a sow which raised 5 litters composed of 18 female and 23 male pigs of which 10 were cryptorchids. Her dam, dam's sister, and her sister produced cryptorchids in various litters, and her sire and grandsire produced cryptorchids.

Artificial insemination has not proved practical under the conditions of swine production in this country. Many reports appear in the foreign literature but, owing to the dilute nature of the semen and the volume necessary to successfully inseminate sows, the practice of artificial insemination has not gained favor.

PATHOLOGIC CONDITIONS

Concretions and preputial calculi occasionally occur in the male resulting in difficult urination and inability to protrude the penis. These conditions are easily detected and are not difficult to correct. Screw-worms may infest the prepuce and cause swelling and distress to the animal.

Specific reproductive diseases of swine have not been studied extensively. Metritis is not so common in the sow as in the larger animals. Retention of the placenta is also of less frequent occurrence and may be a factor on the lowered occurrence of metritis. Recommended treatments have consisted of irrigation and removal of the offending material which is attended by some difficulty due to the small size of the genital organs.

Vulvo-vaginitis has been reported in Australian and American literature and observed by many workers. Females of all ages are affected—even the suckling pig. The etiology is not definitely known, but a similar, if not identical, condition has appeared in herds where moldy corn and moldy barley were being fed. Extensive enlargement of the vulva is usually accompanied by symptoms of estrus, a catarrhal exudate, and general unthriftiness of the affected pigs. Accompanying prolapse of the rectum is not uncommon, and the death rate is said to be high. Treatment consists of discontinuing the feeding of moldy corn or other feeds.

NUTRITIONAL FACTORS

Hale[28] reported embryonic injury to swine due to vitamin A deficiency previous to, and during, the early period of gestation. He found various eye defects and abnormalities, including absence of eyes.

Vitamin A deficiency in gilts or sows usually results in considerable irregularity in breeding behavior. Some fail to breed, while in others, according to Hughes, Aubel, and Lienhardt,[29] the heat periods are more frequent than normal and of longer duration. A sow moderately deficient in vitamin A may abort or a resorption of the fetuses may take place. In some cases the young may be born at regular term, but may be dead or so weak that they died shortly after birth.

An abundant supply of calcium is needed for breeding swine. In a study of the effects of calcium deficiency on the reproductive performance of sows and gilts, Evans[30] reported that when brood sows' rations are deficient in calcium, farrowing is difficult, the milk supply is low, and the few

pigs that survive are likely to be weak and unthrifty.

BRUCELLOSIS

In some studies on naturally occurring brucellosis in swine, the author[31] has shown that reproductive failures were associated with Brucella infection. Eight naturally infected sows studied over a two-year period farrowed only 14 litters of pigs when bred for two farrowings per year. In other words, less than one-half the expected number of litters were produced. Of the 129 pigs born in these 14 litters, 44 were stillborn and 17 were weak and died within two days after birth.

Often the only recognized symptom of brucellosis in swine is an increased rate of sterility. During the 1943 spring farrowing season, 37 of the first 100 sows and gilts bred had failed to conceive in one Brucella-infected herd under observation. In another herd the swine herdsman had repeatedly experienced difficulty in breeding gilts. His efforts to overcome this infertility by nutrition and management had failed. When 3 such infertile gilts were examined, it was found that all 3 had a purulent cervicitis and metritis, and *Brucella suis* was recovered at postmortem examination from the uterus, ovaries, and regional lymph nodes, of each of the 3 gilts. Subsequent to these findings, a complete herd test revealed approximately 80 per cent reactors in the swine of breeding age.

Infertility associated with Brucella infection is not confined to the female but may be seen in the male as well. Elimination of *Brucella suis* in the semen of infected boars has been a consistent finding by the author and his associates.[32] Lack of sex desire and decreased semen quality with occasional complete sterility have been observed. In one series of studies with 6 naturally infected boars, Hutchings and Andrews[32] showed that 63 of 92 semen samples examined contained *Brucella suis*. Andrews and Hutchings,[33] in a study of semen quality of these same boars found that the semen volume was 69.4 ± 17.73 cc.; sperm concentration 161,000 ± 22,600; and sperm motility at 5 C., two and four tenths (2.4) ± one and twenty-nine hundredths (1.29) days. The sperm concentration per cubic centimeter of semen compares favorably with other studies made, but the semen volume is less than one-half that reported by others: hence, the total number of sperm was less than half that reported for normal boars by McKenzie *et al.*[22] The average size of litters sired by 4 of these Brucella-infected boars was 5.6 pigs, which is a very low average litter size.

Unilateral castration of 2 aged Brucella-infected boars showing orchitis and no sex desire apparently aided in returning these boars to an active breeding status. Following recovery from castration, 1 boar was used to breed 13 sows, 8 of which conceived and farrowed litters which averaged 11.25 pigs. The other board was used to breed 20 sows, 15 of which conceived and farrowed litters which averaged 9.26 pigs. Whether these boars would have been safe to use in a brucellosis-free herd was not determined, but such valuable boars could be used to breed infected sows if an effort were being made to preserve desirable blood lines.

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Suspected Diaphragmatic Hernia in a Draft Horse

When I was called to see the case in the spring of 1946, the owner reported that the horse—a 14-year-old gelding—had suffered a peracute attack of colic while working in the field. The animal appeared normal when I arrived. Auscultation of the chest revealed no abnormal heart sounds but active borborygmus. The same sounds, *i.e.*, muffled heart and loud intestinal noises, were revealed in subsequent examinations. The horse had been a good worker except for having suffered minor attacks of colic some months previously. He appeared normal at rest but could not stand a hard pull in the collar. At this time (Dec. 1, 1947), the horse appears healthy and does light work. A tentative diagnosis of diaphragmatic hernia with displacement of intestine into the thorax was made. Later a case report published in the JOURNAL (Dec., 1946, p. 459) dispelled my mental reservations.—*L. M. Koger, D.V.M., Ontario, Ore.*

Procaine Intravenously

Reduction in the amount of inhaled or injected anesthetics required for surgical anesthesia can be accomplished by the use of procaine intravenously. It prevents and corrects cardiac arrhythmia caused by certain anesthetics, especially in poor surgical risks, and alleviates postoperative pain (*Canad. M.A.J.*, Oct., 1947). The procaine was dissolved in physiologic saline solution, distilled water, or 5 per cent dextrose in the strength of 1 Gm. to 1,000 cc. and, on occasions described, pentothal, curare, or d-tubocurarine were injected through the tubing into the instreaming solution.—*Abstr. J.Am.M.A., Dec. 27, 1947: 1171.*

The Harmfulness of Talcum.—The ban on the use of talcum (magnesium silicate) for gloves in human surgery and obstetrical work was due to its acting as a foreign body when it gains entrance to living tissues. Its irritant action is real and microscopically demonstrable. Although no comparable reaction has been detected in animal surgery, its free use as a filler for dusting powders is something to ponder.

"The Golden Gate in '48"

CLINICAL DATA

Clinical Notes

Tryptophane lowers the amount of sugar in the blood. This fact was recently discovered incident to a study of the rôle of amino acids in caries prevention.—*Sci. News Letter, May 3, 1947.*

There is no proof that lymphomatosis is transmitted through the egg.—*Hutt and Cole, Cornell University.*

Uncommon Reactions to Penicillin.—Photosensitization, sensitivity to heparin, and abortion have been reported as reactions to penicillin therapy in human patients.—*Davis in Cur. M. Dig., Sept., 1947.*

The Thyroid in Tuberculosis.—Studies by Izzo and Cicardo of Buenos Aires (*Am. Rev. Tuberc.*, July, 1947) led to the conclusion that the thyroid gland exerts an influence on the development of tuberculosis. Thyroidectomy in guinea pigs increased their susceptibility to experimental tuberculosis, while thyroxin injections given before or simultaneously with inoculations of tubercle bacilli prolonged the period of survival.

Test and Slaughter.—Dr. R. A. Kelser of the Grayson Foundation and Dr. C. D. Stein of the U.S. BAI have recommended the destruction of horses affected with the disease (infectious anemia) in order to avoid the possible spread of the contagion.—*The Blood Horse.*

Penicillin Sensitivity Due to Fungous Infection.—Because the fungi commonly responsible for dermatomycosis are capable of producing penicillin, it is possible that patients afflicted with fungous infection will become penicillin sensitive. If illness requiring penicillin therapy develops subsequently in such patients, use of the drug may cause dissemination of the fungous lesions.—*Case Report, J.Am.M.A., Aug. 30, 1947.*

Pasture and skimmilk have an approximately equal protein value for swine.

About one-third of paratuberculous cows do not react to johnin.—*Jacob Jansen, Utrecht, Holland.*

The disinfectant of choice recommended by the USDA for killing the virus of avian pneumoencephalitis (Newcastle disease) is a 2 per cent solution of sodium hydroxide.

Studies in Connecticut (*J. Dairy Sci.*, Sept., 1947) showed that milk yields were highest for cows freshening in February and lowest for those freshening in July. Percentagewise, the difference was 13.7.

Insulin Shortage.—The American Meat Institute is recommending concerted effort to save the pancreas of all cattle, calves, and hogs because of a reported increase in the incidence of diabetes. Already the supply of insulin is beginning to lag behind the demand.

Leptospirosis Rat-borne.—All of the human cases of leptospirosis critically investigated in France and Holland in 1936-1937 were traced to bathing in water contaminated by rats. Of 10 cases studied between 1926 and 1945, in 6 there was a history of immersion in water.—*From the Lancet, Sept. 20, 1947.*

Sulfonamide Detector. — To find out whether a client has treated a patient with sulfonamides, place a drop of 25 per cent hydrochloric acid on white blotter or filter paper and, when it has soaked in, place a drop of urine on the spot. A color change to yellow or orange red indicates sulfonamide in the urine, according to Dr. H. W. Jackson, of Colorado State College.—*Haver-Glover Messenger, Sept.-Oct., 1947.*

Baby Pig Disease

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SINCE the term baby pig disease has no specificity, it is perhaps desirable to describe in general the malady with which this paper is concerned. The term as used here refers to a highly fatal disease of newborn pigs, which is apparently unrelated to the transmissible gastroenteritis described by Doyle and Hutchings. The pigs, which are farrowed by apparently normal sows, generally appear normal at birth but within a matter of hours show symptoms of disease. One of the first signs is diarrhea. It may appear as early as six hours after birth, but generally is evident at 24 to 48 hours of age. The most marked symptoms are generally evident between 48 and 72 hours of age. The hair becomes rough, the pig may squeal as if in pain and show little desire to nurse. The pigs generally develop coma and die between the third and fifth day. Variations in individuals and in litters do occur.

Baby pig disease is really not new but annually is becoming more prevalent. Hurt reported on a three-day sickness in California in garbage-fed pigs as early as 1934. Somewhat later, Doyle of Indiana and Graham, Sampson, and Hester of Illinois reported on similar conditions in newborn pigs in their respective states. The Illinois group referred to this condition as hypoglycemia. In 1944, Madsen, Merle, Heemstra, and Miller reported on studies made on pigs with a similar malady at the Beltsville, Md., Research Station. These men identified the condition observed by them as associated with acute uremia. To this already confused nomenclature must be added the term alimentary toxemia, contributed by Kernkamp and Roepke of Minnesota.

The classifications of Hurt and of Kernkamp and Roepke are based on symptoms, whereas those of the Illinois and Beltsville groups are based on biochemical changes. Our present understanding of this disease, however, does not indicate that any of these classifications should have preference over any of the others. It is for this reason that the simple but nonspecific term, baby pig disease, is used in this paper.

ETIOLOGY

The specific etiology of baby pig disease is not known, although a substantial number of research workers have attempted to determine the cause. At the present time, most of the men working on the disease contend that an inadequate diet for the gestating sow is basically responsible. This conclusion was reached largely because of the failure to identify an infectious agent associated with the disease. This concept cannot be supported from our studies.

Originally, the Hormel Foundation swine herd was established to study the nutritional requirements of swine. Every effort was made to feed adequate diets to both gestating and lactating sows, but still baby pig disease occurred in serious proportions. Approximately 90 per cent of the pigs farrowed in April and May of 1945 were lost to this disease. Since the disease at that time was considered to be caused by inadequate protein in the diet of the gestating sow, soybean meal, linseed meal, tankage, meat scraps, liver meat meal, fish meal, skimmilk, and dried skimmilk were fed alone and in combination, at a level of 14 to 18 per cent. The incidence of baby pig disease was not reduced. Similarly, the vitamin content of some of the diets was increased by the addition of varying amounts of distiller's solubles, dried skimmilk, skimmilk, alfalfa meal, cerophyl, and liver meat meal. Sufficient data have been gathered to show that sows fed any one of the diets may farrow pigs which have typical symptoms of baby pig disease and die shortly after farrowing.

In further observations which discredit the concept that baby pig disease is basically one of faulty nutrition, the diet of some of the sows and gilts was supplemented with pasture. No significant differences were noted in the livability of pigs farrowed by dams which had access to pasture over those farrowed by dams which did not. For those who advocate pasture as a cure and preventative of baby pig disease, the following experience is related. During the period of extreme losses among baby pigs in the Hormel Foundation herd in May, 1945, it was suggested that a reduction of losses might come about if the sows were put on clean pasture. Plans were made to carry out this suggestion, but before the pasture was

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From the Hormel Institute, University of Minnesota, Austin.

ready, losses were greatly reduced with no change in diet.

Many have had similar experiences, and it is embarrassing to be unable to assist clients losing a large number of pigs. It is indeed difficult to tell a farmer who is feeding an apparently adequate ration that his losses are due to faulty nutrition.

REVERSED ANAPHYLAXIS

In the *Cornell Veterinarian* (July, 1947), we countered the concept that baby pig disease is related to nutrition by pointing out the possibility that infection is more logically involved. The hypothesis was presented that baby pig disease is in reality one of reverse anaphylactic shock in which the antigen has been transmitted through the placenta to sensitize the pig *in utero*, and the antibody has been concentrated in the colostrum of the dam. This hypothesis is relatively simple and is based on immunologic principles. The entire background of this hypothesis may be had by those that are interested by reading our paper *(loc. cit.)*.

In anaphylactic shock, union of antigen and antibody *in vivo* is essential. Our interest at present is to see wherein these requirements are met in baby pig disease.

Let us consider the antigen first since, as already indicated in the hypothesis, that portion of the shock principles is involved first in the disease. In presenting our hypothesis, we had indirect evidence that a virus was serving as the antigen. By a careful study of the herd records, it was shown that the highest mortalities resulted in pigs farrowed by dams which were exposed to infection three to four weeks before end of term. This would appear to mean that the dams had undergone a subclinical infection at that time and the virus responsible for that mild infection passed the placenta and reached the pigs *in utero*. Thus, the sensitizing antigen hypothetically reached the unborn pig.

Following recovery of the dam from the mild virus infection, specific antibodies were produced. Antibody titer in the dams would be expected to be at its highest at the end of three weeks. Antibodies which could neutralize the antigen are not passed to the pigs because of the impermeability of the placenta to antibodies. Thus, the two essentials of anaphylaxis are met in a sensitized unborn pig which supplies the antigen and the immunized dam which supplies the antibody in the form of colostrum. Shock takes place at the time of the initial feeding of the newborn pig.

The intensity of the shock is an important consideration in baby pig disease since the outcome of the individual is apparently dependent upon the primary shock. We know that reversed anaphylactic shock can be elicited experimentally in intensities varying from acute fatal shock to mild transient reaction. Since, however, the initial shock occurs shortly after birth with death following in from twenty-four to seventy-two hours, we are most interested in subacute shock. Experimentally, the only immediate symptoms manifested are vomiting, scouring, and a rough coat.

For the past four months, we have been testing the hypothesis of reversed anaphylaxis experimentally. It is not possible at this time to remove this concept of baby pig disease from the hypothetical category. However, in testing the hypothesis, more and more evidence is being gathered to indicate that such a phenomenon may occur in swine.

To date, our efforts have been largely on exploring hog-cholera virus as a possible agent in baby pig disease. We have injected virus into 8 immune sows from three to five weeks from end of term and studied their litters thoroughly. A mild sort of baby-pig-like disease was apparently produced by hog-cholera virus. The 8 sows farrowed an average of 8.6 live pigs, but weaned only 2.1 pigs at an average weight of only 21 lb. This is to be compared to the herd average during the same period of 8.9 live pigs farrowed with a weaning record of 5.3 pigs averaging 28 lb. Thus, pigs farrowed by immune dams reinjected with hog-cholera virus during the last few weeks of gestation had a poor survival and poor growth record. Many of you have observed this in practice. The important point is that hog-cholera virus, although capable of producing a baby-pig-like disease, does not cause baby pig disease as seen in the Hormel Foundation swine herd.

Similar experimental work has been done with BTV (Boynton's tissue vaccine). In January, 1947, we put our herd on a strict vaccine program. Many pregnant dams were given BTV and when they farrowed in the spring their pigs had baby pig disease. In order to learn whether the BTV could produce baby pig disease, 6 sows were

injected in June five weeks before they were due to farrow. Five of these dams farrowed excellent litters, all of which were weaned at good weights. The sixth dam farrowed a litter of 4 pigs all of which died within twelve hours. Thus, it would appear that the injection of BTV in late pregnancy is not in itself harmful. Obviously, other factors must be considered.

In addition to our studies on hog-cholera virus, we have conducted experiments with pseudorabies virus. Although this virus is not currently considered of serious consequence in swine, I think we have underestimated the actual economic loss it may cause to the farmer. Pseudorabies, although highly fatal and noncontagious in cattle, causes a mild but highly contagious disease in swine. This virus, similar to that causing swine influenza, causes a more serious diseases in young animals than in old. Since in baby pig disease we are concerned with pigs *in utero*, a marked effect would be expected.

Thus far, we have only studied six litters from sows exposed to or infected with pseudorabies. In this work, sufficient data were not obtained to say that pseudorabies virus can or cannot cause baby pig disease. We did obtain evidence, however, and this is very important, that pseudorabies virus is capable of killing pigs *in utero* when the dam is infected between three and five weeks from end of term. This is the only range in which we have been working, but we will extend our efforts so that the whole period of gestation is covered.

The experimental work just described for the viruses causing hog cholera and pseudorabies in swine is not complete. We know that there are many loopholes in our work and have only intended these experiments as a screening process.

We have similar experiments underway with swine-influenza virus, and we also intend to study the virus of swinepox. When we have screened these viruses, we will go back and study thoroughly those viruses showing the most promise as the etiologic agent in baby pig diseases.

I have given no suggestions as to how this disease may be handled in the field. I have nothing to offer as an improvement over the injection of glucose or the hand feeding of concentrates. Both of these treatments are useful in nourishing the pigs through the shock period, which is the basic essential of treatment. Until the exact nature of a disease is known, it is not possible to determine the best method of control. For this reason, we have spent our time on the etiology rather than on treatment. We want to try many things but until adequate control is established in our own herd, we shall refrain from raising false hopes. We have a great asset in that we can work with 350 litters of pigs over the coming year. Since these will come at an approximate rate of a litter each day, we have great hopes that we may soon be of service to the profession and to the farmer through advancement of the understanding of baby big disease.

DISCUSSION

DR. L. M. HURT (Los Angeles, Calif.): Dr. Young spoke of work reported in the livestock department of Los Angeles County recently. I can give you a first-hand picture. Our work, as you know, is almost entirely with garbage-fed stock. The condition is more or less incidental in certain hog camps from year to year. By changing the regimen and by instituting supplemental feeds, we avoid it. That does not preclude the possibility of virus at many of these plants.

We find the feeding practice has been important in the success of handling our problem. Sows kept out in pasture long enough before farrowing seldom have trouble, but those kept in the farrow houses or lots for five days or more almost always lose their litters with baby pig disease.

The angle the Doctor is working on will shed some important light on the complexities of baby pig disease in years to come.

Microbicide Treatment of Chronic Infections

The mastery of certain acute infections with antibiotics and sulfonamides conveyed no imputation of similar results in chronic infections until W. H. Feldman and associates of the Mayo Clinic, working with streptomycin against tuberculosis, and I. Forest Huddleson of Michigan State College, working with sulfadiazine and fresh whole blood in brucellosis, were able to make interesting preliminary reports on the chemotherapy of these two major chronic infections of man and animals. There seems to be no impropriety in pointing out that both of these steadfast investigators are claimed as longtime members of the AVMA —Feldman a graduate of Colorado State ('17) and Huddleson of Michigan State ('27). Clinical trials of these methods in the two diseases, published in current medical literature, while perhaps not sensationally resultful have shown, at least, that chronic bacterial infections are not as invulnerable to chemotherapeutic treatment as was formerly supposed.

Symposium on Newcastle Disease

(Avian Pneumoencephalitis)

At the Cincinnati Session of the Association, Aug. 18-21, 1947, the following symposium was presented in the Section on Poultry. The members of the symposium were Dr. Erwin Jungherr, Storrs, Conn.; Dr. T. C. Byerly, Washington, D. C.; Dr. H. E. Moses, Lafayette, Ind.; Dr. C. A. Brandly, Madison, Wis.; and Dr. F. R. Beaudette, New Brunswick, N. J.

Report of the Committee on Modes of Spread of Newcastle Disease

ERWIN JUNGHERR, Vet. Dipl., D.M.V.

Storrs, Connecticut

The present report is concerned with three phases, namely, (a) statistical observations on the occurrence of the disease in Connecticut during the period from Oct. 1, 1946, to July 15, 1947,* as an epizoötiologic example in a dense poultry population; (b) observations on the carrier problem; and (c) observations on the longevity of avian and bovine pathogens on burlap strips.

Epizoötiology.—In the age group of 1 to 35 days, 29 cases were observed comprising an affected 46,375 chicks with a mortality of 0 to 75 per cent (av. 11.4%). The diagnosis was made in 9 cases by clinico-pathologic examination, in 9 by neutralization tests, and in 11 cases by virus isolation.

In the age group of 42 to 120 days, 12 cases were observed comprising an affected 46,200 chickens with a mortality of 1 to 23 per cent (av. 5.8%). The diagnosis was made in 2 cases by clinico-pathologic examination, in 10 by neutralization tests, and in no case by virus isolation.

In the age group of 150 to 420 days, 37 cases were observed comprising 58,460 chickens with a mortality of 0 to 6 per cent (av. 1.5%). The average loss in egg production was 80 per cent. The diagnosis was made in 4 cases by clinico-pathologic examination, in 31 by neutralization tests, and in 2 cases by virus isolation. In addition, 11 chicken and 3 turkey samples obtained from pullorum disease reactors showed positive neutralizing antibodies for Newcastle disease.

In Kansas, Dr. L. D. Bushnell has diagnosed the disease in several lots of chicks originating outside the state. One case apparently was due to exposure in transit, since the hatchery of origin failed to show evidence of the disease. Transmission in the battery room took place after an incubation period of ten days.

Carrier Problem.—A flock of 200 straight run chicks, normal except for slight coccidiosis and free from Newcastle disease according to neutralization tests, was exposed by spraying with virus material containing approximately 10^4 embryo minimum lethal doses (m.l.d.'s) per cubic centimeter at the age of 34 days. Symptoms of depression, anorexia, and upper respiratory disease commenced within four days postexposure and continued to varying degrees for about three weeks, with a total mortality of 12 (*i.e.* 6%). Two birds (1%) had to be culled on account of nervous symptoms. From birds submitted for necropsy, Newcastle virus was reisolated from spleen and air sac on the tenth, twelfth, and nineteenth day postexposure. Of oral and fecal swabs taken from representative birds on the tenth, nineteenth, twenty-second, thirty-sixth, fortieth, and fiftieth day postexposure, all were negative for virus isolation, except one fecal swab on the eleventh day. Blood samples taken from the eighth to the fiftieth day were positive for 10^3 or $>$ neutralizing doses.

The above experimental house was emptied, subjected to cursory cleaning, and immediately restocked with 250, 1-day-old cross cockerels. Unfortunately, these latter chicks proved to have come from a Newcastle-immune flock as was indicated by positive neutralization tests during the first three weeks of brooding. However, some serologic tests were still postive at the age of 31 days, at which time one would normally expect disappearance of antibodies. Further tests are in progress and are looked forward to for a decision as to the passive or active nature of the immunity.

In a smiliar experiment conducted under

Dr. Jungherr is professor of animal pathology at the University of Connecticut, Storrs; he was chairman of the committee on modes of spread of Newcastle disease, Eighty-fourth Annual Meeting, AVMA.

*Period chosen because similar data for Aug. 1, 1945, to Sept. 30, 1946, are to be published in the forthcoming U.S.L.S.A. report.

the direction of Drs. L. T. Giltner and Hall, of the USDA, the pens were depopulated after a natural outbreak of Newcastle disease and restocked without cleaning within two weeks. After about four or five weeks, a number of birds showed significant neutralizing antibodies without symptoms.

In exposing susceptible birds to naturally recovered birds for a period of one month, Dr. P. P. Levine found that thus far the disease had not been transmitted thirty days after recovery.

Started chicks proved to be the principal factor in the dissemination of Newcastle disease in Minnesota. In studies of the carrier problem in adult stock by Dr. B. S. Pomeroy, eggs were obtained from a flock approximately sixty days after recovery from an acute outbreak and hatched at triweekly intervals for six months, without obtaining clinical or serologic evidence of Newcastle disease in the resulting chicks.

Introduction of susceptible birds into the depopulated, but otherwise intact, pen or mixing of susceptible birds with the adult stock at time of first egg collection, likewise failed to produce the disease during an observation period of six months.

Longevity on Burlap.—Small sterile and nonsterile strips of burlap were brought into intimate contact with Newcastle virus, fowlpox virus, *Salmonella pullorum, Staphylococcus aureus, Pseudomonas aeruginosa, Aerobacter aerogenes, Streptococcus agalactiae,* and *Brucella abortus,* stored in glass tubes at approximately 29 F., humidity 45 per cent; 61 F., humidity 51 per cent; and 72 F., humidity 7 per cent; and tested for viability after varying intervals.

The results so far indicate that Newcastle virus remained viable on nonsterile burlap strips for twenty days, regardless of the environmental conditions provided. On sterile strips, the virus remained viable at 29 F. for thirteen days, at 51 F. for twenty-five days, and at 72 F. for fifty-five days. In these tests, Newcastle virus was more resistant than fowlpox virus but, of course, less than *S. pullorum* which survived for over one hundred days.

Comment.—While none of the experiments permits any final conclusion, the available results point toward the importance of the inanimate carrier, due to the tenacity of the virus outside the body, in the spread of Newcastle disease.

Report of the Committee on Incidence of Newcastle Disease

T. C. BYERLY, Ph.D.
Washington, D. C.

The Bureau of Animal Industry borrowed two of the best statisticians of the Bureau of Economics to go into the Middle Atlantic region to make a statistically adequate survey of Newcastle disease by visiting selected farms (involving about 1 million chicks), and then to treat these data. In addition, they summarized the data provided in case histories by poultry pathologists in 21 states. I will report, in a brief summary, the results obtained.

With respect to the incidence of the disease in the Middle Atlantic region, 83 farms were surveyed. Blood samples were drawn from chickens on 49 of these farms and diagnosis made in the laboratories of the Bureau of Animal Industry. Of the 49 flocks subjected to laboratory diagnosis, 22 were positive, 27 were negative. Of the 22 that were positive, 16 were clinically diagnosed by the veterinarian, and only one positive clinical diagnosis was not verified in the laboratory. Six cases that proved positive on laboratory diagnosis were not diagnosed clinically.

The incidence of this disease in the Eastern Shore region is 30 per cent. This survey covered more than a million chicks adequately plotted over the entire region, and it checked plus or minus 10 per cent with the stated estimates made by pathologists working in the region. It, therefore, probably is a fair estimate.

The losses caused by the disease, a matter of considerable importance, were plotted against time. The chickens were of various ages, and our estimate of losses from death during the growing period (12 to 18 weeks) for the flocks affected with Newcastle disease is 20 per cent. For the control flocks negative to Newcastle disease, the mortality was 10 per cent. In other words, the losses in flocks infected with Newcastle disease in this region were twice those in uninfected flocks. There is an additional loss caused by a longer feeding period before the birds reached marketable age. We do not have an accurate estimate of the additional period required to finish the birds, the increase in feed consumed, or the loss in weight.

A subjective report, based on replies of the growers, states that it required about two weeks longer to finish the birds in flocks affected with Newcastle disease.

Dr. Byerly is senior poultry husbandman, U. S. BAI, Washington, D. C.; he was chairman of the committee on incidence of Newcastle disease, Eighty-fourth Annual Meeting, AVMA.

Data regarding the history of previous flocks and present flocks with respect to other enumerated diseases were also tabulated. Among the 58 negative flocks—based on clinical and laboratory diagnosis—18 had no disease history in the previous brood or in the brood present in the house at the time of the veterinarian's visit. In the 25 positive flocks—based on clinical and laboratory diagnosis—only two had this same disease-free history; apparently there are good broiler operators and poor broiler operators; there are people who have disease troubles and those who do not.

There was no specific sanitary practice that might account for this difference, but when we inquired about the sanitary procedure, those with Newcastle disease-free farms were doing a little better job on the average than those where the disease was present.

We have also tabulated data supplied by pathologists in about 21 states, covering outbreaks of the disease in a total of 545 flocks in 176 counties, and a total of 990 tests. A few additional reports have come in since this tabulation was made.

A brief summary will reinforce a point made by Dr. Jungherr. Of 148 cases studied in young chickens, 39 were received as started chicks (roughly 26%). In my opinion, that is a high percentage in chicks infected as started chicks.

One interesting case history was supplied by a man who bought 200 chicks in a distant state and placed them in his battery with about 4,000 other chicks. He bought the 200 for flock improvement and distributed them, approximately, 25 to each flock.

Very shortly after that, the flocks to which he sent these chicks reported the presence of Newcastle disease. No other Newcastle disease outbreak was attributed to that hatchery. They distributed day-old chicks without trouble, but there was plenty of trouble with Newcastle disease in the started chicks.

Based on the voluntary reports or on case histories submitted, the incidence of the disease in various portions of the country is about twice as high in young chicks as that shown in our Middle Atlantic region. I am not convinced that the mortality in the Middle Atlantic region is much lower than in the country as a whole. Probably most of the difference between the average mortality in the case histories submitted and that found in the survey is attributable to the fact that where there is no serious trouble it is not reported.

Probably those submitted to the laboratory were the more serious cases, in general. However, both in the Middle Atlantic data and in the case histories submitted, there is evidence that the smaller flocks have a higher mortality than the larger flocks. Apparently, a man who has more dollars invested in the chicken business does a better job of taking care of his chickens.

The voluntary reports, with one notable exception, hover around mortality of 35 per cent in young chicks. In the data plotted from the Middle Atlantic survey, the mortality differences didn't show up until about the seventh week of the incubation period. The average time of outbreak was about the fourth or fifth week, but chickens continued to die in many cases until they were sold.

In the laying-hen, adult flocks reported, the usual history was that egg production ceased almost entirely. The loss of eggs amounted to two to four weeks' production for affected flocks.

The most important thing in these data was the high proportion of started chicks. It is significant with respect to disease control that some flocks have disease, and if they do, they are likely to have Newcastle disease. Apparently, sanitary practices do help to control it. We found large flocks with no history of the disease and neighboring farms with a disease history which proved disastrous.

I cannot make any statement with respect to the geographic incidence of the disease. I know of no reason why there should be a difference between the Middle Atlantic region and the rest of the country, except, perhaps, that the poultry population in that region is a bit more congested.

Report of the Committee on Newcastle Virus Properties

H. E. MOSES, D.V.M., M.S.
Lafayette, Indiana

The cause of Newcastle disease is certainly an outstanding feature of the problem. And yet, in considering the relative importance of the various phases, the virus and its properties was placed in the last position because it was felt that information regarding the distribution, the immunology, and the diagnosis outweighed the importance of knowing, immediately, more about the properties of the virus.

Dr. Moses is associate pathologist, Purdue University Agricultural Experiment Station, Lafayette, Ind.; he was chairman of the committee on properties of Newcastle virus, Eighty-fourth Annual Meeting, AVMA.

This section was divided into six categories, namely, the resistance of the virus to physical and chemical agents, the susceptibility of species, the preservation of the virus, the comparative virulence of various strains and modifications of virulence, the age susceptibility of chickens and other susceptible fowl, and the size of the virus.

There is hardly a phase dealing with the other subjects of the whole picture into which this information does not enter. The resistance of the virus to physical and chemical agents was summarized earlier in this program by Dr. Cunningham.

The structure of the virus outside the body is known to us in only a fragmentary manner. Certain disinfectants will kill it under well-defined conditions in the laboratory. How that information will benefit us from the standpoint of all the many field variations remains to be seen.

Sodium hydroxide has been of less value in destroying virus than it has been in connection with other infectious agents. Destruction of the virus by sodium hydroxide is quite irregular, and small amounts of it may be detectable for an hour after subjection to a 2 per cent solution. Exposures at room temperature differ somewhat from the common procedure of using sodium hydroxide in a very hot solution.

The quaternary ammonium compounds look promising, as do sodium hydrochloride and calcium hydrochloride. I wish to emphasize the circumstances of the test. The disinfection to destroy the virus is beset with the problems which concern the destruction of all other infectious agents outside the body.

We, and many of you, have a little information on fumigation. Many people wish to know how a large room or an incubator can be rid of virus that may be present.

In terms of formaldehyde fumigation, we did some work indicating that at temperatures of 85 to 90 F., and with high humidity, double strength fumigation will certainly kill the virus in twenty-four hours. We do not know the minimum.

Dr. Jungherr has information with a bearing on this. How well should we clean and how much should we disinfect when confronted with a room or a house where the virus may have been deposited some weeks, or perhaps a month, before? Perhaps the virus is no longer living under the circumstances of its environment.

Susceptibility of species applies to chickens, turkeys, and ring-neck pheasants, under natural field conditions. The human being may be infected by the American form of the virus. Experimentally, Mongolian pheasants and quail are also susceptible, as are hamsters and sheep.

Preservation of the virus in the laboratory is best at —70 F. and possibly in the fluid form rather than lyophilized.

Virulence and its modification was discussed in another paper. Age susceptibility studies continue to indicate that adult fowl are less susceptible than younger birds.

The size of the virus as judged by its filterability was the subject of an interesting publication about a year and a half ago, by Cunha and associates of Duke University.

Virus has been seen under electron microscopes. The environment in which the agent is prepared and photographed may have a bearing upon its shape. It appears to have a sperm shape. Earlier estimates of the size of the virus are verified, but the measurements of the forms photographed suggest that the previous measurements applied only to the so-called headpiece of this sperm-shaped organism.

This is the present state of information about Newcastle virus and its properties. Some information is available, but much more is needed if we are to answer the practical questions put to us in the field.

Report of the Committee on Newcastle Disease Immunization

C. A. BRANDLY, D.V.M., M.S.
Madison, Wisconsin

The need for improved methods of immunization is emphasized by these reports. The high viability of the virus under adverse conditions on inanimate agents suggests that the virus does not perish quickly in nature; hence, the desirability of perfecting satisfactory immunizing agents.

The first consideration is that we are apparently committed to live with it. Since

Dr. Brandly is professor of veterinary medicine and agricultural bacteriology, University of Wisconsin, Madison; he was chairman of the committee on Newcastle disease immunization, Eighty-fourth Annual Meeting, AVMA.

regulatory measures have not been successful, there is no other means of control; therefore, the greater need for satisfactory immunization.

The problem of immunization is more difficult than some others. Many phases can be studied in the laboratory to good advantage. However, to study immunization one must have certain facilities for isolation and for holding animals. After that, the recommended procedures must be applied on a pilot scale in the field.

The delays in obtaining suitable facilities have contributed to the fact that little has been published. A good many people who have intended to work on it have not been able to do so.

Let me mention briefly the development of immunization in Newcastle disease. When it was first recognized as a separate entity the first thought was to use a killed virus vaccine, or one modified by chemical means.

The tissues from the infected birds were employed, and we know from experiences with Newcastle disease that the virus content may vary widely in different organs of the same bird. The results of initial experiments were irregular. That was partly overcome when it was learned that the virus could be propagated in eggs, and was uniformly distributed throughout the egg at a higher titer than was obtainable in the tissues. This permitted the preparation of chemically killed vaccines with a uniformly high virus content.

The limitations of tissue vaccines were appreciated early in the work, and that started the search for modified virus vaccines. Attempts were made to adapt the virus to mammals in order to produce a suitable modified vaccine.

Our work with the Hertfordshire strain of virus suggested that it might be attenuated and make a satisfactory live virus vaccine. This strain was isolated from the 1933 outbreak in England, and after 33 passages in one instance and 14 passages in another, the pathogenicity for chickens was greatly reduced, so that its use as an immunizing agent was suggested. That product is still being used in India.

A duck-modified vaccine was reported and recommended for use. Some preliminary work with egg-modified vaccines was done in Boston and the results were encouraging. The residual paralyses, which every worker has encountered, are inherent in all living virus vaccines, and they suggested that further modifications were necessary. Recent experiments using chickens raised in the poultry plant at the University of Wisconsin brought out the same problem encountered with pox and other virus vaccines.

These birds apparently had latent blackhead and coccidiosis infections. When the modified virus was injected, there was activation of those diseases, and losses occurred, directly due to blackhead and coccidiosis. That emphasizes one of the reasons why laboratory results are not comparable to field results in many instances: most laboratory animals and birds are raised under sheltered conditions and are free from disease.

The report this morning describing another step in the direction of modification, is the first report of satisfactory transfer of the virus to mammals. It is anticipated that this type of vaccine might be modified satisfactorily, kept at a stable state of modification, and used as a vaccine. Its pathogenicity, under normal conditions, for other species including man must be determined.

Recently, the Philippine workers, after favorable reports on the killed virus vaccine, have attempted to use the living modified virus vaccine. Members of the committee have expressed, from time to time, the hope that others who had not previously indicated their intention or ability to do some of this work, because of physical limitations, would be able to undertake it; and that the limitations, as well as the possibilities, of these various vaccines would be investigated more fully, particularly the possibility that under certain circumstances the very satisfactory immunity which is obtainable with the killed virus vaccines could be improved by secondary live virus inoculation.

Report of the Committee on Diagnosis of Newcastle Disease

F. R. BEAUDETTE, D.V.M.
New Brunswick, New Jersey

Our committee is concerned with diagnosis based on isolation of the virus from infected birds, on neutralizing antibodies, or by other methods that may be developed.

Another problem which concerned us was the necessity of making blind passages when a diagnosis was made on isolation of the virus. For the past two and a half years, we have based our diagnoses on isolation of virus; we have studied the relative incidence of the virus in the brain, the

Dr. Beaudette is poultry pathologist, New Jersey Agricultural Experiment Station, New Brunswick; he was chairman of the committee on diagnosis of Newcastle disease, Eighty-fourth Annual Meeting, AVMA.

spleen, the exudates from the respiratory tract, the material from the ovary, and in the yolks of eggs still in the oviduct.

We have examined tissues from 537 flocks and have recovered the virus in 105 of them. In several instances, we recovered the virus from more than 1 bird in the flock. This gives us better than 20 per cent recovery, as compared with Dr. Osteen's report of 14 per cent recovery.

Among the 537 flocks, we knowingly included many outbreaks which we would not diagnose as Newcastle disease, merely to assure ourselves that when we made a diagnosis of encephalomalacia, we were not confusing it with Newcastle disease. We included cases of epidemic tremor and bronchitis, naturally cutting down our percentage of recoveries of the virus. But, even under those conditions, we were able to recover the virus from better than 20 per cent of all flocks examined.

We found that of the tissues examined (spleen, brain, exudates from the respiratory tract, material from the oviduct, and eggs in the oviduct and the ovary itself), the spleen showed a higher incidence of virus (50%). The brain was lowest, and in between these two extremes were respiratory exudates, the ovary, and the oviduct eggs (about 33%).

This means that one who elects to base his diagnoses on recovery of the virus will do well to select spleen first for examination. The next selection would be either respiratory exudates or material from the ovary or oviduct eggs. Respiratory exudates require either filtration or sterilization by means of antibiotic agents.

There seems to be a tendency to avoid diagnosing the disease by means of virus examination because of the high incidence of contaminants in tissues. We have not had any great trouble with contaminants in collecting tissues.

In collecting brain, we do not open the skulls of chicks up to 7 or 8 weeks of age. We only remove the skin from the skull and then sear the skull. We have prepared very coarse capillary pipettes which are sterilized. We thrust these directly into the brain and suck in the small quantity of brain substance, which is then ejected into a very small (50 to 75 mm.) tube, and we hardly ever have contamination.

In collecting spleen material from young chicks, we use forceps sterilized in flame and cooled in a Petri dish. The whole spleen of small chicks is removed immediately on opening the carcass and placed in the type of tube already described.

In larger birds, the splenic tissue is collected by means of the capillary pipette as described. Likewise, material from the ovary is collected by means of the capillary pipette. Oviduct eggs are opened by grinding an opening in the shell at the air cell end and thrusting a syringe into the yolk. A smaller needle is then applied and the syringe used directly for the inoculation of eggs.

By these methods the tissues may be collected easily and with a low percentage of contaminants. The work may be further facilitated by grinding the tissues in the tube with the pipette that is used to transfer the broth or the suspended material to the tube; take a cubic centimeter pipette and aspirate 1.5 cc. of broth into it; before releasing the broth, use the tip of the pipette to crush the tissue against the wall of the tube, and then flood in the broth.

In only about two-thirds of the cases in which the virus is recovered will all embryos die on the first passage. In one-third some will not die, but if the material is taken from 1 of the dead embryos it will kill all embryos in the second passage.

The time of embryo death should be considered. One may disregard embryos that die within the first twenty-four hours. Only in exceedingly rare instances is it possible to report recovery of the virus from an embryo dead within the first twenty-four hours. When an embryo dies after this time, the virus may be carried on.

There is a general impression that an embryo should die within ninety-six hours, but some which die as late as the fifth or sixth day may contain the virus. A single death on the sixth day will be significant. One may also use antibiotic agents in sterilizing respiratory exudates.

The question of blind passage recovery of the virus has been raised. In one instance, Beach carried material through 31 blind passages before the virus killed embryos. We have encountered no such situation, but on primary inoculation of a series of eggs with a given tissue, in one-third of the cases some of the embryos live.

From several cases in which we had demonstrated the virus in the embryos that did die, we selected eggs that did not die in that same series and passed allantoamnionic (a.a.) fluid from those eggs into the second generation, and in the limited number of tests which we have made we succeeded in recovering the virus in only 1 case. In all other cases, 100 per cent of the second series of embryos on the third and fourth passage lived.

We believe that it is not necessary to make blind passages in the recovery of

this virus, as seems to be necessary in the recovery of bronchitis virus.

This calls for some explanation of Dr. Beach's results, and my guess is that he assumed that an embryo should die by the fourth day. As already pointed out, that is not necessary, since some embryos may die on the fifth or the sixth day. I suspect that if he had held his eggs for a longer time he would have found that it was not necessary to make blind passages.

Another part of our committee's job was to determine the relative efficiency of the hemagglutination-inhibition (HI) test and the serum-neutralization (SN) test. Dr. Osteen has covered a good part of that material this morning and has given the results of his comparative tests.

Another phase of our work was suggested by Dr. Dean of California, namely, a study of the rate of development of HI bodies and SN bodies. The California people propose to study this but have made no report.

Clinical Aspects of Canine Distemper

On several occasions since the war ended, new clinical forms of canine distemper have been described in European literature, *i.e.*, infections that do not conform to the characteristic clinical picture: initial depression, followed by variable degrees of digestive, respiratory, nervous, cutaneous, and ocular reactions, or in rare cases by slow resolution without complications. This familiar chain of events is said to have been replaced by sweeping epizoötics presenting new syndromes associated with the presence of Carré's virus in at least some of the cases critically studied. Several atypical forms have been described, to wit:

1) The dogs present hyperthermia, inappetence, and red-violet conjunctivae of weeks, months, or longer duration, without any organic localization whatsoever, and die after a short period of nervous involvement.

2) The dogs present a bad state of ill health without fever, refuse to eat, and usually die without exhibiting any distinguishing complications.

3) A highly mortal digestive form characterized by a tenacious diarrhea that quickly becomes hemorrhagic and manifestly dehydrating.

4) A respiratory form, now less frequent, that presents a bronchopneumonia less suppurative than usual, incessant dry coughing, labial breathing, and pus-soiled nostrils.

5) A nervous form, presenting myelitis, encephalitis, and posterior paralysis, right from the start, and leading to death or chorea.

These atypical forms have been found to attack adult as well as young dogs, artificially immunized dogs, and recovered cases. Serum therapy and other treatment was found to be ineffective.

Owing to the absence of means and of the difficulty of proving its presence (ferret inoculations, inclusion body studies), canine distemper (Carré's) virus has not been demonstrated in more than a third of the specimens studied; therefore, in attempting to explain the nature of these atypical infections, various theories have been proposed. The "dry distemper" ascribed to a virus differing from Carré's virus (Pugh, 1937) is known to exist in France; Liegeois of Belgium regards these sweeping epizoötic infections to be a sort of grippe; and there are the leptospiroses to be considered inasmuch as canine carriers of *Leptospira canicola* are known to be common. Nervous complications of leptospirosis are not rare.

In view of the encephalitides of dogs and foxes demonstrated by Green in America, it is evident that there are other diseases that we have been content to diagnose as canine distemper. At least, in the light of these new clinical forms, it is obvious that the last chapter on the pathology of Carré's virus remains to be written.

An abstract from an address on "La Maladie de Carré" by Professor Brion at "Les Journées Vétérinaires de Lyon," June 7-8, 1947. Rev. Méd. Vét., 98, (Sept.-Oct., 1947) : 409-422.

Chickens' Tolerance to Helminths

Chickens 23 days old experimentally infected with the eggs of *Ascaris galli* tolerated the infection of 1 to 46 worms without harm during an observation of four weeks. The average number of worms in range-infected chickens was 17.9 ascarids. Chickens experimentally infected with the tapeworm *Rallietina cesticillus* tolerated without harm from 2 to 172 of them. The average tapeworm in the range-infected chicken was 61.5 per bird, which is more than the average number found in chickens under field conditions. The study of the birds included the rate of growth, blood-sugar levels, and hemoglobin values. The difference between the controls and the experimentally parasitized birds was not significant.—*From Biol. Abstr. Sec. E, (Apr., 1947):1009.*

Immunization of Chickens Against Newcastle Disease

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THE IMMUNIZATION of poultry against Newcastle disease [pneumoencephalitis] through the use of a killed virus has met with little success. However, chickens recovered from natural infection or inoculated with a potent live virus will develop an immunity which appears to be permanent. Hence, a study of the different isolated strains of virus was conducted to discover a strain which would have potential value in a practical immunization program. A study of different strains of Newcastle virus has revealed a great variation in virulence between strains. Furthermore, virulent strains have been subjected to environments which have altered their virulence.

Among several strains of virus which have been isolated from natural outbreaks of the disease and which have been propagated in embryos, one was selected for its immunizing possibilities. In the first trial, the vaccine consisted of undiluted chorioallantoic fluid freshly harvested from embryos which died forty-eight hours after inoculation with the virus. Each of 6 birds (10 weeks old) known to be susceptible to Newcastle disease were injected with 0.5 cc. of the vaccine intramuscularly. No symptoms were observed following inoculation. At frequent intervals, the serums of the birds were tested with the hemagglutination inhibition test. Seven days after vaccination, all birds had a hemagglutination inhibition (HI) titer of 640. Two birds in this group were challenged with a potent virus eighty-five days after vaccination. Each bird, as well as 2 susceptible birds (approximately the same age), received intravenously 0.5 cc. of the potent virus. The vaccinated birds revealed no symptoms, whereas the controls died with characteristic symptoms of Newcastle disease.

In the following seven trials, the vaccine was applied by the cutaneous "stick" method in the web of the wing, using two needles, similar to the method employed in fowlpox vaccination. The advantages of this method over the injection method are obvious. The vaccine used in each trial was prepared essentially in the same manner as in the first trial, except in 1 case where the vaccine was diluted with an equal part of glycerin. A total of 36 susceptible birds, ranging in age from 9 to 25 weeks, were vaccinated. Some birds exhibited "takes" forty-eight hours after vaccination, and all birds showed this reaction on the fourth and fifth days. No readable "takes" were present eight to ten days after vaccination. A "take" was characterized by a definite swelling and congested area at the site of the needle punctures in the cutaneous and subcutaneous tissues. As the swelling and congestion subsided, a yellowish discoloration of the skin developed. A general systemic reaction was noted in that some birds exhibited a slight decrease in activity and appetite. Positive HI titers (160 to 640) were observed in all birds ten days after vaccination. Some birds had positive titers on the seventh day. No respiratory symptoms were noted, and in 1 bird definite nervous symptoms were observed twenty-two days after vaccination. The immunity of 14 of 36 birds was challenged with a live potent virus. Two birds were challenged sixty-eight and seventy-eight days, respectively, after vaccination, and the remaining 12 birds at twenty-nine days. Susceptible birds of approximately the same age were also challenged. No symptoms were observed in the vaccinated birds, whereas among the controls a morbidity and mortality characteristic of Newcastle disease were noted.

Approximately 11,600 birds on six commercial poultry farms were vaccinated by the stick method. The birds ranged in age from 9 weeks to 18 months. The majority of birds had not attained sexual maturity. The susceptibility of the flock to Newcastle disease was established by the HI test. The vaccine used was prepared from the same virus as was used in the above trials. No respiratory or nervous symptoms were observed in any of the vaccinated birds. Among the immature birds, a slight decline

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in feed consumption was detected. Among the laying birds, egg production and egg quality were adversely affected, as is the case in a natural outbreak. Approximately one month after vaccination, a number of the birds tested with the HI test gave positive results.

Studies in progress reveal that it appears feasible to combine Newcastle disease virus and fowlpox virus for the vaccination of chickens by the stick method. The Newcastle disease "take" precedes that of fowlpox, and the character of the reactions induced by the two viruses are not the same, which facilitates the reading of the "takes" for the two diseases.

In conclusion, it may be stated that strains of Newcastle disease virus of low virulence can be used by the stick method to immunize sexually immature birds without producing an active outbreak of the disease.

Foot-and-Mouth Disease Vaccination in Argentina

A polyvalent, intradermal vaccine developed by the Research Section of the Institute of Experimental Biology of Buenos Aires immunizes cattle against foot-and-mouth disease for twelve months, according to Rosenbusch, Decamps, and Gelormini (the JOURNAL, Jan., 1948: 45-47). Of 2 million cattle vaccinated, there were 7 per cent partial or total failures due to avoidable causes: improper administration, impotent vaccine, spoilage. Most of the treated animals were exposed to reigning enzoötics. The vaccine has a potency duration of thirty days if kept at 3 to 10 C. Satisfactory results were obtained also in sheep but not in swine. In addition to this trial, some 100,000 animals vaccinated in adjacent countries gave similar results. Immunity developed in fourteen days after injection. Vaccine made from quick-action strains of the virus conferred immunity in twenty-four to thirty-six hours, but the duration was shorter—three to four months.

In the light of the true definition of the word, *hybrid* is not being improperly used in the breeding of animals. A hybrid is a cross between a genus, species, variety, or race (breed). The more distant the relationship between the animal crossed, the more likely the offspring will be unable to reproduce, *e.g.*, the ass and the horse.

Chloromycetin

The latest antibiotic agent to make the headlines is named chloromycetin, a close relative to streptomycin. Its source is Venezuelan soil and the producer is Parke, Davis & Co. (*Time*, Nov. 10, 1947). It was discovered by Paul R. Burkholder, Yale University botanist. The newcomer promises to win victories against tuberculosis, brucellosis, certain rickettsiae, and other resistant microbial diseases. An advantage pointed out is that it can be administered effectively *per os*.

Vitamin A and Acetonemia

Writes a practitioner of not a little experience: "Whether vitamin A deficiency is involved in the causation of acetonemia of dairy cows, the fact remains that in my practice the disease occurs almost exclusively toward the end of a low intake of that factor, and stops when the cows are turned into lush pastures." Other clinicians of equal experience fail to verify this statement. Additional information is needed.

Several clinicians after vast observations of many years thought that periodic ophthalmia was of a nutritional nature. The microbe hunters laughed. The U. S. Army Veterinary Corps proved they were right. Practitioners once asked Kitasato "how come" a little nail puncture through the hoof causes tetanus and a big, ugly wound doesn't. Kitasato took the hint and found out. When research sidesteps the established hunches of the clinic, it generally lives to regret.

Ticks Transmit Brucellosis.—In a series of experiments carried out by A. A. Zotova and R. S. Bolditzina (in Russia), 52 female ticks (*Hyalomma marginatum*) engorged with blood of guinea pigs infected with *Brucella melitensis* revealed the presence of the organism in the stomach of one of the ticks. Suspensions of batches of the ticks prepared at once or in twenty-four hours, and injected subcutaneously into guinea pigs, infected 9 out of 10 of them as shown by serologic tests. Check suspensions injected into healthy guinea pigs were negative.—*Abstr. Rev. Applied Entomol., 35, Ser. B, part 7, (July, 1947): 113.*

[This supports the work reported by Tovar in the *American Journal of Veterinary Research* (*8*, July, 1947:138-140).—Ed.]

Animal Skin Diseases and Their Influence on Leather

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IN THOSE animals whose skins are utilized in the manufacture of leather, the economic value of the animal often regulates the extent to which veterinary science is engaged.

In the instance of cattle, sheep, swine, and goats, the economic losses to leather caused by animal diseases in the United States is estimated in millions of dollars. The skin or hide is a by-product of the meat industry, and but little direct consideration is given to the matter. Because of the value of leather, such matters should be of real interest to the veterinary profession.

Leather, which is such a common, every day commodity, receives little more than passing interest by most of us. In fact, it might be difficult for men of this profession to accurately or comprehensively define what leather is. It may facilitate a better appreciation of the conditions to be reported, if I briefly review the physiochemical changes which convert skins into leather. Histologically, we may use cattle skin as a standard.

The outer surface covered with hair becomes the grain of the leather, and any damage caused by disease organisms is reflected upon the surface as a defect. These defects lower the value of leather and, in processing such skins or hides, more effort and expense is concentrated on trying to make a merchantable piece of leather.

The hair and epidermis are removed and do not otherwise influence the finished leather, except where defects are present. The hair becomes a secondary by-product of tanning and is used in making mats to be used under rugs and for other felted products. When mange or other disease conditions affect the hair, its value is lowered as a by-product.

The adipose or loose connective tissue on the undersurface of a skin or hide is also removed before the true hide is tanned. As you remember from your histopathology studies, this is a combination of white fibrous, yellow elastic, reticular, and fatty tissues. It too becomes a secondary by-product, the raw material from which animal glue is made. Its value is low, yet when suppurative subcutaneous lesions exist such portions are discarded and again an economic loss is incurred.

The derma or true skin is mainly an interwoven architecture of collagen (white fibrous connective tissue) fiber bundles. The vascular supply comes from large vessels in the subcutaneous area, and a network of blood vessels is found between the fiber bundles. This material when tanned constitutes leather.

With this picture in mind, let us consider further the economic losses incurred by animal skin diseases.

The simplest injuries, cuts, scratches, and trauma to the animal skin can devaluate its leather potentiality. A deep scratch even when healed will remain as a grain defect and lower the value of the leather. Many times such simple injuries become secondarily infected by microörganisms, and then the extent of the damage is increased and the loss proportionate.

The various manges are collectively the cause of millions of dollars in losses to the people of the United States. All varieties of mange are damaging to the skin, but the most serious variety is the demodectic or follicular mange. It is well known to some tanners that extensive infestation of follicular mange exists in certain quarters, and in the buying of skins these offerings are avoided. As you know, the organisms spread through their entrance into the skin by way of the hair follicle. In cattle and swine the eggs are laid in the skin proper at a level below the root of the hair. When a colony of these organisms have matured and are ready to spread the infestation, the space they occupy may be as large as half the thickness of a steer's hide.

It is not within the scope of this paper

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Director of Research (O'Flaherty) and research associate (Roddy), University of Cincinnati, Cincinnati, Ohio.

TABLE I—Grubbing Percentages of 263,232 Hides of April, 1947, Saltings, Based on Actual Reports Received by the Hide Bureau, Tanners' Council of America.

Origin	N. S.	B. S.	T. S.	H. C.	L. C.	B. C.
Chicago						
Hides ..	13,988	9,214	....	4,585	15,848	5,927
Av. %..	45.9	51.5		30.2	37.7	59.9
St. Louis & E. St. L.						
Hides ..	9,233	1,322	*	1,400	5,400	3,967
Av. %..	43.0	45.0		45.0	45.0	47.7
Ft. Worth						
Hides ..	....	....	3,270	....	*	900
Av. %..			48.8			60.0
Kansas C.						
Hides ..	9,485	9,850	1,230	*	1,763	7,611
Av. %..	58.3	61.0	70.0		62.4	62.7
Okla. City						
Hides ..	....	*	2,374	....	790	2,625
Av. %..			57.2		25.0	57.3
Omaha						
Hides ..	13,157	11,526	....	1,400	4,149	1,516
Av. %..	36.0	47.3		40.0	37.7	47.9
St. Joseph						
Hides ..	5,404	2,499	*	*	2,770	3,126
Av. %..	64.9	67.5			67.1	59.7
St. Paul						
Hides ..	3,775	2,813	....	3,605	9,313	1,600
Av. %..	20.9	61.5		12.4	12.5	50.0
Sioux City						
Hides ..	5,047	5,766	....	*	2,321	1,490
Av. %..	45.0	52.2			39.0	70.0
Sioux Falls						
Hides ..	2,573	*	....	*	*	1,635
Av. %..	15.0					70.0
Albert Lea						
Hides ..	3,000	1,902	....	978	7,511	494
Av. %..	35.0	57.3		30.0	29.0	65.0
Austin, Minn.						
Hides ..	*	1,377	....	2,578	4,983	*
Av. %..		70.0		30.0	26.4	
Brooklyn						
Hides ..	....	600	....	....	....	....
Av. %..		25.0				
Baltimore						
Hides ..	1,185	....	....	....	....	....
Av. %..	7.0					
Cedar Rapids						
Hides ..	2,300	1,500	....	*	*	500
Av. %..	51.7	58.3				70.0
Cincinnati						
Hides ..	*	1,251	....	*	*	*
Av. %..		50.0				

Origin	N. S.	B. S.	T. S.	H. C.	L. C.	B. C.
Cleveland						
Hides ..	*	1,340	....	....	*	....
Av. %..		59.0				
Cudahy, Wis.						
Hides ..	*	728	....	*	*	777
Av. %..		65.0				65.0
Denver						
Hides ..	....	3,605	....	....	....	3,567
Av. %..		60.2				56.5
Des Moines						
Hides ..	1,890	*	....	*	1,773	*
Av. %..	48.2				35.0	
Detroit						
Hides ..	950	....	....	....	....	....
Av. %..	50.0					
Evansville						
Hides ..	557	....	....	....	1,045	....
Av. %..	15.0				15.0	
Indianapolis						
Hides ..	....	1,304	....	*	....	....
Av. %..		50.0				
Jersey City						
Hides ..	....	....	....	....	1,103	....
Av. %..					25.0	....
Milwaukee						
Hides ..	*	830	....	790	1,020	....
Av. %..		45.0		10.0	25.0	
Newark, N. J.						
Hides ..	....	1,285	....	....	....	....
Av. %..		35.0				
Philadelphia						
Hides ..	1,598	*	....	....	....	....
Av. %..	29.4					
Pittsburgh						
Hides ..	405	405	....	....	....	....
Av. %..	22.0	30.0				
Salt Lake City						
Hides ..	....	*	....	....	....	1,596
Av. %..						51.6
Trenton, N. J.						
Hides ..	1,377	809	....	....	....	....
Av. %..	26.8	24.2				
Waterloo						
Hides ..	3,159	2,857	....	*	*	*
Av. %..	61.9	63.8				
Wichita						
Hides ..	261	....	*	....	*	*
Av. %..	65.0					

*None reported. N. S. = Native Steers. B. S. = Branded Steers. T. S. = Texas Steers. H. C. = Heavy Cows. L. C. = Light Cows. B. C. = Branded Cows.

to discuss control methods, but I can report that in some of our investigations we determined that in a skin removed from the animal there is no further spread of such infestation—the mites do not spread in removed skins.

Another and even more serious damage to cattle skins is the grub fly damage from *Hypoderma linearis* and *Hypoderma bovis*. In the Yearbook of Agriculture 1943-47, Science in Farming, it is reported that 12 million lb. of meat are lost annually due to injuries caused by the grub larvae. Since the main site of the organism is in the skin, it is reasonable to believe that even more hide pounds are lost.

The Tanners' Council has for the past ten years kept a statistical record of the amount of grub damage found in hides inspected at packing plants. The complete data are of only passing interest. I shall give you the figures for April, 1947, only. Of 263,232 hides inspected, the average percentage of "grubby hides" (those hides with 5 or more grubs) was over 50 per cent. Table 1 gives the detail of origin and the types of these hides. I am indebted to Mr. Lewis Jackson, director of the Hide Bureau, Tanners' Council of America, for these data. With the effectiveness of rotenone-containing materials, *i.e.*, derris

powder and cube powder, there is no reason for this great loss.

The life cycle of the Hypoderma flies is much like a fairy story, but the mutilation of the hides by these organisms is very real. We spent more than a year in our study of this damage and the latter larval stage is associated with the greatest mechanical damage. In many instances the débris left by the larva and the possible tissue injury when the larva emerges favor secondary bacterial infection and suppuration.

If, in the course of the life cycle, the larva leaves the hide and then by action of the reticulo-endothelial mechanism repair is accomplished, the scar tissue fibers are nearly all placed in one direction which leaves a noticeable scar and constitutes a weakened area in the hide. Often the healing takes place about the metabolic waste left by the larva, and then a very materially weakened area results. This is important in the utilization of the resulting leather. Even in shoe soles this is undesirable, for these areas wear poorly, and in mechanical leathers like harness and belting the tensile strength is reduced.

External parasites of the animal skin are a source of mild damage to the skin and reflect upon the resultant leathers. The biting varieties of lice leave small marks where they have been anchored to the skin. The ticks, because of their number, will cause extensive small area damage in a hide much the same as the biting lice.

The main damage done by external parasites is the injury to the skin, but when conditions are sufficiently insanitary to permit extensive lice infestation, the same conditions invite microörganism infection to the broken skin, and a very extensive involvement results.

The damage done by external parasites even when complicated by secondary infections does not impair the serviceability of the leather. Their damage is one of unsightliness—they devalue the leather. In the overall economics of the matter, it becomes a very costly damage. During the life of the animal, much weight is lost due to irritation suffered. Occasionally, due to rubbing on barbed wire or posts with nails in them, extensive damage is done. It is such an unnecessary evil that every care should be taken to avoid external parasitic infestation.

A real loss results in such skins because, due to the lesions which may be open injuries or scars, the tanner must put much more work on such skins and use more material, such as finishes, than he would on a nonaffected skin. His costs are increased as much as 15 to 20 per cent while the value of the leather is reduced as much as 50 per cent.

It may seem a bit strange to include intestinal parasites as influencing the leather made from the skins of such animals. It is, however, evident that in bad intestinal parasitism there are skin lesions present. These are minor from a leather standpoint, but constitute a very definite, if uneconomic, condition.

The various variolas such as cow- and swinepox are also the cause of reduced leather value in the skins of the animals having these diseases. It is true that the exanthematous lesions are generally confined to the skin of the abdomen, but this part makes leather too, and in such instances it is often so devaluated as to be not worth processing.

Ringworm, as a group of fungus-caused diseases, can damage a skin, and where such a condition is extensive real losses result. The lesions are scar tissue formation on the epidermis. They vary in size from that of a dime to a silver dollar. The lesions are not always circular but may by confluency become irregular areas covering the larger part of an animal skin. It goes without saying that such skins produce leather of greatly reduced value.

Thus, we see that there are innumerable disease conditions which reflect upon the animal skin and constitute great economic losses to the livestock industry and the leather industry. Since their control and prevention rests with the veterinary profession, it should be of direct interest to every practitioner to do everything possible to avoid these losses.

Brucellosis Research. — A program for obtaining antibiotic agents from thermophilic organisms active against *Brucella abortus* is under way at the brucellosis research laboratory of the University of Texas (*J. Bact.*, May, 1947). Several fungi, actinomycetes, and bacteria that form substances inhibitory to Brucella have been isolated in pure culture from composted manure.

Canine Leptospirosis

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CANINE leptospirosis was first reported in Europe in 1916 and in the United States in 1923.

Of the 16 species of Leptospira reported from all parts of the world, only two strains, *Leptospira canicola* and *Leptospira icterohemorrhagiae*, have been isolated from dogs to the United States. *Leptospira canicola* was first recovered from dogs in this country by Meyer and his coworkers[1] during an enzoötic of the disease in California in 1937 and *L. icterohemorrhagiae* by Randall and Cooper in 1943[2] from dogs with the disease in Washington, D. C.

During the course of infection, the dog excretes the organisms in the urine. The stage of leptospiruria is recognized as a potential health hazard to man, since both strains of Leptospira which affect dogs in the United States are pathogenic for human beings.

EPIZOÖTIOLOGY

The disease has been diagnosed with increasing frequency in the United States since 1937 and is now known to be a common infection of widespread distribution in this country; nevertheless, the number of reported cases here continues to be disproportionately less than in European countries. Its true incidence in this country is not known, and it will not be possible to obtain this information until there is a wider appreciation of its prevalence and until a marked improvement is made in diagnostic laboratory procedures.

Data compiled by Raven[3] on the incidence of canine leptospirosis in different localities in the United States, as determined by serologic tests, indicate that 11 to 38 per cent of the dogs in this country are temporary or permanent carriers and shedders of Leptospira. The majority of the infections in dogs in the United States are caused by *L. canicola* and only a few cases by *L. icterohemorrhagiae;* this is in contrast to the findings in European countries.

Canine leptospirosis occurs in both sporadic and enzoötic forms, with a tendency for rapidly spreading enzoötics of the disease to appear in localities for short periods of time.

The disease may occur throughout the year, especially in areas having mild winters. A higher incidence of the disease is found in male dogs and in animals over 3 years of age. The incubation period is estimated to be between five and eighteen days with an average of nine days. Meyer and his coworkers[1] contend that *L. canicola* maintains its host to host relationship through simple contact, being eliminated in the urine of active or convalescent cases, and chronic carriers. Habits of greeting being more general for the male than for the female, a higher incidence of *L. canicola* in the former is readily explainable.

It is known that 10 to 40 per cent of the wild rats in the United States harbor *L. icterohemorrhagiae*, and that, when once infected, rats continue to excrete Leptospira in the urine for the rest of their lives. Further, this organism can maintain its virulence in stagnant water, if it is neutral or slightly alkaline, for a period of twenty-two days. Thus, it is thought that the majority of infections in dogs with *L. icterohemorrhagiae* are acquired by killing infected rats, and drinking or wading in infected water, and not by dog to dog contact. This question requires further investigation. We observed a dog with *L. icterohemorrhagiae* infection that was not known to be a rat catcher but was housed with a dog that was a proved shedder of the organism. The latter dog had a history of having killed rats in a chicken house.

Leptospira canicola has not been isolated from trapped wild rats nor is it possible to establish infection in rats with this type of Leptospira. Thus, it would appear that the rat is not a link in the chain of transmission of *L. canicola* but that the disease is passed from dog to dog independently of rats.

CLINICAL FEATURES

Authorities recognize two clinical forms of the disease in dogs, the icteric type and the hemorrhagic type. While it is the opinion of Wirth[4] that the forms with icterus are due to *L. icterohemorrhagiae* and the anicteric to *L. canicola*, these two types of leptospirosis, as observed in this country, are usually clinically indistinguishable.

Serologic surveys indicate that many

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cases are mild and are unrecognized clinically. Dogs sick enough to be presented for treatment are usually cases in which the disease is acute and accompanied by severe symptoms. In this stage the clinical characteristics are variable, and it is difficult to differentiate leptospirosis from other common febrile diseases and from intestinal obstruction. In several cases studied we have followed the animals from the first stage of the disease through convalescence in an endeavor to evaluate various general and symptomatic therapy, as well as diagnostic laboratory procedures.

Septicemic Stage.—In the first stage of the disease there is usually marked depression and the animal moves cautiously. An examination of the patient reveals muscular tenderness, nasal and ocular discharge, congested sclera and mucous membranes. The temperature may range from 103.5 to 105 F., with the pulse and respiration rates above normal. There is usually anorexia and vomiting with constipation or diarrhea. Leptospira may be demonstrated in the circulating blood at this stage. The agglutination test is negative as there are no circulating antibodies.

Toxic Stage.—In three or more days, the animal shows evidence of toxicity accompanied by marked polydipsia and polyuria. The temperature may be slightly above normal to subnormal. During the toxic stage, the disease progresses to the hemorrhagic type or the icteric type with cases frequently showing an overlapping of these two cardinal conditions. The animal displays a staggering gait. There is poor elasticity of the skin, and the cervical lymph glands are palpable. Symptoms of nephritis with varying degrees of uremia and a characteristic fetid breath, with mouth lesions that may progress to ulceration, are present. At times a blood-tinged diarrhea occurs, indicating a hemorrhagic enteritis. Dehydration and emaciation become evident.

Fatal cases usually die within five to ten days of the first evidence of illness. If the animal survives this stage, convalescence may begin as early as the second week or extend to the sixth week. Animals reaching the convalescent stage usually have a characteristic markedly roughened crown of the nose.

DIAGNOSIS AND TREATMENT

Diagnosis.—In a typical case, the disease can be tentatively diagnosed from clinical findings; however, final proof should depend upon laboratory means, including agglutination tests.

During the septicemic stage of the disease, which usually lasts for seven days, Leptospira circulate in the blood stream and can be demonstrated by a dark field microscopic examination, and by the inoculation of whole blood into suitable laboratory animals and culture mediums. Leptospira disappear from the blood stream during the second week and begin to appear in the urine. An early diagnosis is desirable since penicillin and immune serum have marked activity against infection due to *Leptospira*, especially in the early stages of the disease.[5] In our experience, and that of others, the dark field examination of dog's blood and urine for Leptospira has not given clear-cut findings, due to the presence of motile artefacts. Our attempts to isolate Leptospira from the blood and urine by injection of material into young guinea pigs, rats and mice have been as unsatisfactory as were those of Meyer and his coworkers,[1] since guinea pigs, mice, and rats are resistant to infection with *L. canicola*. Direct culture methods were also disappointing. However, we have found that both *L. canicola* and *L. icterohemorrhagiae* cause marked jaundice and a fatal leptospirosis in 3- to 4-week-old hamsters within six to ten days after intraperitoneal injection with whole blood and urine from dogs in the early stages of leptospirosis.[2] A strongly acid urine rapidly kills Leptospira; therefore, 5 to 15 Gm. of sodium bicarbonate is administered to the dog in divided doses the day preceding catheterization. The Leptospira are concentrated by centrifugation of the urine samples and the sediment suspended in 2 to 3 cc. of normal saline solution.

For diagnostic purposes, the macroscopic and microscopic agglutination tests are excellent after infection is well established; and the tests are also valuable in making surveys. Unfortunately, measurable specific antibodies do not appear until about the twelfth to fourteenth day after onset of illness and at a time when the animal may be on the road to recovery. Within three to four weeks, the maximum titer is reached and measurable antibodies may re-

main, in most instances, for several months to years. A negative agglutination test after two to three weeks of illness eliminates leptospirosis, and strong false-positive reactions are unknown.

The microscopic test has been found to be the more satisfactory of the agglutination tests, but it requires extensive equipment, including a dark field microscope. The macroscopic test is more practical to use and is sufficiently sensitive to have excellent diagnostic value when a suitable antigen and clear serum are employed. A macroscopic agglutination titer of 1:100, or higher, is considered positive.

Treatment.—Various opinions have been expressed regarding the value of specific immune serum and penicillin, employed in combination or each alone, in the treatment of canine leptospirosis. Since the disease varies greatly in severity in different animals, it is difficult to assess the value of therapy. There is strong evidence, however, that these two therapeutic materials are of distinct value, especially if employed early in the course of the disease. If immune serum is given, the dose should be adequate, *i.e.*, 1 cc. per pound of weight on the first day and 0.5 cc. per pound of weight the next day. The dosage of penicillin suggested by Murphy[7] is 10,000 to 15,000 units in 1 cc. of solution, intramuscularly, every three hours until 200,000 units have been given. We have preferred to use penicillin in beeswax and peanut oil in doses of 50,000 to 100,000 units every twelve hours and have used up to 1,000,000 units in some cases.

Heilman,[8] in comparing the relative protective effect of streptomycin and penicillin on experimental leptospirosis in hamsters, found penicillin to be more effective.

The sulfanilamides apparently do not have any effect on Leptospira but may be of value in controlling secondary infections. Supportive treatment should include 5 per cent glucose solution intravenously, as an ample supply of fluids is essential. Vitamins K and the B complex, along with a diet rich in carbohydrates and proteins, should be employed as soon as the animal is able to retain food.

AUTOPSY FINDINGS

The autopsy findings in acute canine leptospirosis have been fully described by Bloom,[9] Meyer,[1] Jones,[10] and other writers.

It is agreed that the disease in its acute phase has the characteristics of septicemia, with involvement of the entire body. The rôle played by liver damage in the production of icterus is not fully understood. It is indicated that renal damage, with the resultant uremia, and not the inconstant liver necrosis, is of first importance as a cause of death. Further, as the disease progresses the organisms tend to localize in the kidney where they induce long standing and characteristic lesions.

PREVENTION OF LEPTOSPIROSIS

Measures for the prevention of the infection have seldom been applied to dogs but, in areas where the disease is enzoötic, protection can be obtained by vaccination and the rat-proofing of kennels. According to Walch-Sorgdrager,[6] vaccination is commonly resorted to in miners and sugar-cane workers in areas where the incidence of the disease is high, with effective immunization being obtained through the use of heat-killed suspensions of Leptospira.

CANINE LEPTOSPIROSIS AND ITS RELATION TO PUBLIC HEALTH

The number of recorded cases of human leptospirosis due to *L. canicola* infections does not exceed 30. Most of the cases have a history of contact with dogs having the disease. We have had experience with 2 human cases of *L. canicola* infection acquired by caring for sick dogs that we proved to be shedders of the organism. Further, the dog may shed Leptospira after apparent recovery from the disease and continue to be a health hazard to man.

SUMMARY

There is evidence that canine leptospirosis is more common in the United States than heretofore believed.

Laboratory means, including agglutination tests, should be used to make an accurate diagnosis.

Specific immune serum and penicillin, employed singly or in combination, usually have a favorable effect, especially if used early in the course of the disease.

Dogs, during the stage of leptospiruria, are a potential health hazard to man.

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Red Squill Poisoning in a Dog

Rietz and Moore[1] cite cases of red squill poisoning in swine that resulted from the ingestion of a raticide containing this drug. It is commercially prepared in wafer form. Being heralded by the manufacturers as toxic to rodents only, ordinary precautions are sometimes considered superfluous.

On Nov. 30, 1947, a 3-year-old Collie (male) was presented with a history of vomiting for three days. The temperature was 100.2 F., the sclera deeply injected, and the appearance one of lassitude. No light on the etiology could be given by the owner at the time. Barium sulfate meals administered were not retained. On the following day when the emesis became more severe, fluoroscopy was employed, but with negative results. Parenteral injections of salines, glucose, and amino acids (Parenamine) were given to counteract the alarming dehydration and starvation. Metrazol was administered to stimulate the cardiovascular system. Alternate doses of bismuth subnitrate and barium sulfate were given but not retained. The dog had difficulty lapping and swallowing water, and would also vomit soon after drinking. The treatment was continued for the following two days with gradual improvement. On the evening of December 3, the temperature was 101.9 F., and all symptoms had abated. He has since recovered completely.

It was during the crisis that the owner advised me that her daughter saw the dog eating some of the red squill rat poison just prior to its illness, but believing that the raticide was nontoxic to domestic animals, it was not even suspected.

Squill has been used therapeutically as an emetic by virtue of irritating the gastrointestinal mucosa. Because rodents cannot vomit, this drug is used with success. Sufficient quantities, however, can be lethal to any other animal. It would seem that the legend on the commercial containers should mention this fact.—*Albert C. Nagle, D.V.M., San Antonio, Texas.*

[1]Rietz, J. H. and Moore, E. N.: Red Squill (Raticide) Poisoning in Swine. J.A.V.M.A., *103*, (Feb., 1943): 120.

BAL

BAL (=2,3 dimercaptopropanol), British anti-lewisite, is widely discussed in medical literature as a blood coagulant in thrombopenia and granulocytopenia and for modifying the toxic action of arsenic in antisyphilitic arsenotherapy. The response reported in thrombopenic purpura is suggestive of its use in purpura hemorrhagica of horses. It reduced coagulation time markedly—from twenty minutes to two minutes—and increased the platelet count from 2,500 to 280,000 in a case reported by A. Schrumpf, M.D., in the *Journal of the American Medical Association* (Dec. 27, 1947).

Glutamic Acid

Glutamic acid, a water-soluble crystal, marketed under a number of trade names and long a palliative treatment for mild epilepsy, has attracted wide attention through popular magazines as a drug that "improves the intelligence." According to controlled experiments on laboratory rats, it sharpened their ability to solve intricate problems to obtain food. Children and adolescents mentally retarded were improved in some instances and mentally injured in others. The decrease in frequency of mild attacks of epilepsy (petit mal) and the increase in alertness are generally credited to the drug. Owing to the frequency of spastic attacks in dogs, glutamic acid ought to be tried in veterinary medicine. The *Journal of the American Medical Association* warns against its commercial exploitaton. Based on the dose in human beings, the canine dose would range from 6 to 24 Gm. per day.

Equine Encephalomyelitis in New Jersey Pheasants in 1945 and 1946

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THE FIRST outbreak of equine encephalomyelitis in pheasants occurred in New Jersey in 1938, and since then the disease has appeared every year excepting 1940 and 1941. Previous reports[1, 2, 3, 4] have recorded these outbreaks through 1944, and the purpose of this one is to describe those of 1945 and 1946.

SALEM OUTBREAK, 1945

Specimens from the first outbreak in 1945 were presented on September 26 at our branch laboratory in Vineland, where one of us (J.J.B.) collected brain and spleen tissue aseptically from 2 pheasants and brain tissue from a third bird. These tissues were frozen and brought to New Brunswick for inoculation.

The three brain tissues were suspended in broth, checked for sterility, and each was inoculated into 3, 10-day-old embryonated eggs on October 5, in a dose of 0.15 cc. Seven of the embryos died within twenty-four hours, and the remaining 2 (both received brain from bird 2) were dead by the second morning. The first 7 eggs were harvested on October 6, and the remaining 2 on October 9. The changes in the embryo and yolk-sac vessels were typical, and cultures from each egg were negative.

The two splenic suspensions were inoculated on October 20, in a dose of 0.2 cc., but except for 1 embryo which died within twenty-four hours and was contaminated, all lived through eight days of incubation, after which they were destroyed. Thus, the virus was not present in the spleens.

A second passage of the virus isolated from 1 bird was made on July 2, 1946, at which time it had been held 269 days at —20 C. The 6 embryos inoculated died within twenty-four hours. The second passage of the virus from the other 2 birds was made on Oct. 28, 1946, when the inoculum was 384 and 387 days old, respectively. That held 384 days and harvested from the 2 eggs dead on the second day did not kill embryos until the morning of the second day, whereas that held 387 days and originating in 2, 24-hour dead embryos killed 2 embryos in this time and a third by the morning of the second day.

The outbreak at Salem, N. J., is the first pheasant case from Salem County. However, the disease is not uncommon in horses in this area. The owner reported that the disease began the latter part of August in the youngest of four broods, hatched at weekly intervals, which at that time was about 11 weeks old. Affected birds staggered, lost the use of their legs, refused food and water, and died in about two days. Diarrhea was usually present. Although unable to stand, the birds seemed to have better use of their wings. Sometimes the head and neck were extended on the ground. The total loss was about 200 out of 1,200 young birds kept in a large holding pen. The mortality dropped sharply after cold weather on September 20, and the last death occurred on October 2. The largest daily mortality was 13.

Four paralyzed birds recovered the use of their legs. A fifth bird was not paralyzed but stood with eyes closed, head depressed, and took no notice of surroundings.

Each brood had been transferred to the holding pen at the age of 6 weeks. The pen was 200 by 450 ft. and was covered with wire. It was on low ground, and at one time, after a heavy rain, several inches of water stood at one end of the pen. During the breeding season, this pen had housed breeders for the past two seasons

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since, being covered, it prevented crows from stealing the eggs.

In addition to the 1,200 held in the above pen, there were 319 the same age as the youngest in the holding pen but which were kept in brooder houses across the road. This population never became affected.

The farm has been in operation for six years, and this is the first appearance of the disease. There is no history of the introduction of birds from other farms. The farm is within ½ mile of the Delaware River, and Mill Creek bounds the premises on one side. Ticks and mosquitoes were plentiful in season and the birds had some Capillaria and gapeworms.

We are informed that the owner had part of the 1946 crop vaccinated and left some birds as controls. No losses from encephalomyelitis occurred in either group.

NEW GRETNA OUTBREAK, 1945

The second outbreak to come to our attention in 1945 occurred at New Gretna in Burlington County, N. J. The virus had been isolated from outbreaks on this farm in 1943 and 1944 as already reported. Four dead pheasants were received on Oct. 2, 1945. The birds were in good flesh, and 3 of them showed some enteritis. In the fourth bird the liver was somewhat enlarged and showed small necrotic areas. The spleen was pale and showed small caseous nodules. Slight swelling of the liver and duodenitis are frequently seen in encephalomyelitis in pheasants, but the changes noted in the fourth bird are not related to the disease. Cultures from the liver were negative except that a colon type was isolated from the bird showing necrosis of the liver and spleen.

A brain suspension of each of the 4 pheasants was inoculated into 10-day-old embryonated eggs on October 5 using 3 eggs for each suspension and a dose of 0.15 cc. per egg. The virus was definitely recovered from 2 of the birds. In one positive case 2 embryos were dead within twenty-four hours and the third was dead on the morning of the third day. One of the embryos dead at twenty-four hours supplied inoculum for a second passage made on Oct. 28, 1946, that is, after holding the material at —20 C. for 387 days. All embryos died within twenty-four hours and were typical.

In the second positive case, 1 embryo was dead within twenty-four hours, 1 died on the sixth day, and the third was still alive eight days after inoculation. This bird was not thought to be positive because in all previous recoveries of the virus all embryos have died on primary passage. That the case was positive, however, was shown by the fact that in a second passage made on Oct. 28, 1946 (after 387 days), with material from the 24-hour dead embryo, 2 embryos died within twenty-four hours, and a third was dead on the morning of the second day.

The brain suspension of a third bird killed 1 embryo within twenty-four hours, 1 within thirty-six hours, and the third was thought to be dead at thirty-six hours but on harvest was found to be alive. A second passage was attempted with the liver suspension of the latter embryo after 387 days and the results were negative. A liver suspension of the 24-hour dead embryo killed only 1 of 6 embryos inoculated on July 2, 1946, that is, after holding 269 days. Unfortunately, this embryo, as well as the 36-hour dead embryo of the first passage, was discarded so that subinoculations were not possible. However, since the virus is easily active after this holding period, it may be presumed that the brain of this bird did not contain virus.

The results of the inoculation of the brain suspension of the fourth pheasant were similar, that is, 1 embryo died within twenty-four hours, 1 within thirty-six hours, and the third was still alive eight days after inoculation. The liver suspension of the 24-hour dead embryo failed to kill the 3 embryos into which it was inoculated 387 days later, and the suspension of the 36-hour dead embryo failed to kill 3 embryos inoculated 395 days later.

The loss on this farm was approximately what it had been on the occasion of the two previous years, that is, 500 birds each year out of about 1,500.

FORKED RIVER OUTBREAK, 1945

The third outbreak of 1945 occurred on a large farm at Forked River in Ocean County, N. J. The disease was definitely diagnosed here in 1939, and there is good evidence that outbreaks occurred also in 1937 and 1938. However, no outbreaks occurred between 1939 and 1945.

On Oct. 6, 1945, 4 dead and 3 live pheas-

ants were presented for examination. One of the live birds was unable to stand, because of paralysis of the legs. The autopsy was negative except that 1 bird had a pair of gapeworms. Brain tissue was collected aseptically from each bird, and the 3 live birds were bled from the heart.

On October 13, each brain sample, which had been frozen in the meantime, was suspended in broth and about 0.2 cc. inoculated into each of 3, 10-day-old embryonated eggs. Except in the case of eggs inoculated with a suspension from 1 live pheasant, all embryos were dead within twenty-four hours. In the one exception, only 1 of the 3 embryos inoculated died, and this occurred on the morning of the second day, while the other 2 were still alive eight days after inoculation. A subinoculation from the single dead embryo was not made until Feb. 18, 1947, that is, 491 days later. The results were negative. Thus, the virus was recovered from 6 of the 7 birds presented. A second passage was not made until July 2, 1946, when only one of the strains was inoculated into 6, 11-day-old eggs; all embryos were dead within twenty-four hours. The material from which the inoculum was made had been held 260 days at —20 C.

Inoculation of eggs with the three samples of blood serum on October 20 gave negative results, thus indicating the absence of virus in the blood of the 3 live pheasants, 2 of which had yielded virus from the brain.

The 1945 Forked River outbreak is the most disastrous to date as regards losses. The birds involved were contained in two houses and an open pen. House A consisted of 12 pens, six on a side with one pen vacant. House B, about ¼ mile from house A, consisted of six pens, one of which was empty. The open holding pen was about 10 ft. from house B, and near the end containing the empty pen. The number and kind of birds in each pen, as well as the daily mortality from the beginning to the end of the outbreak, are given in table 1.

The table shows that losses began on September 31 in pen 3 of house A. The next day, 3 birds died in the holding pen which is at a considerable distance from house A. It is quite evident that the disease did not spread regularly from one pen to the adjoining one. Pen 7 of house A, for example, joined pen 1 of that house at the rear and yet a month intervened before the appearance of the disease in pen 7.

The table also shows that, when the disease appeared in a given pen, the mortality reached a peak within a relatively short time. In seven pens the peak mortality was reached on the third day, in five pens on the fourth day, in one pen on the fifth day, in two pens on the sixth day, and in one pen on the ninth day. The figures also show that the mortality stopped nine to twenty-two days after it began in each pen, the average duration being fifteen and eight-tenths (15.8) days. The mortality curve would suggest spread by contact rather than by an insect vector.

The figures show a difference in mortality in the two sexes of the same age. Thus, in the 1,059 young cocks the mortality was 681 (64.3%), and in 2,963 young hens a mortality of 2,239 (75.6%). There was, however, considerable variation in the mortality in the individual pens of young hens, ranging from 49.7 per cent to 92.2 per cent. However, in the four pens (house A, pens 7 and 8; and house B, pens 2 and 4) showing less than a 70 per cent mortality, the disease began in three of them late, that is, after November 1, and the lowest mortality occurred in the last pen to become affected (house B, pen 4). On the other hand, sex may be of little consequence, for the one pen that contained 320 of both sexes (ratio not known) showed a mortality of 198 (61.9%). Again, there were two pens of yearling hens, and the one having 377 birds suffered a loss of 280 (74.3%), while the other having 375 birds showed a loss of 359 (95.7%), yet only ten days elapsed between the appearance of the disease in these pens.

The total mortality of the 5,094 birds in affected pens was 3,757 (73.8%). The last death occurred on November 24.

A most striking feature is the fact that the 50 young cocks in pen 6 of house A did not suffer a single loss in spite of the fact that the pen next to it had a loss of 82.4 per cent and the one to the rear (pen 7) a loss of 68.5 per cent. Finally, there were 1,500 birds in a brooder house that never contracted the disease. These were the youngest birds on the farm.

PREVENTIVE VACCINATION

Because of the heavy loss in 1945 at Forked River, the management of the farm

TABLE I—The Daily Mortality Figures by Pen in the 1945 Forked River Outbreak

House					A								B					Holding pen	Totals in affected pens
Pen no.	1	2	3	5	6	7	8	9	10	11	12	1	2	3	4	5		
Kind of birds	YC	YH	YH	YH	YC	YH	YH	YH	YC	YH	YC	YC	YH	H&C	YH	Yr.H	Yr.H	
No. birds	267	472	280	188	50	302	311	333	282	414	300	210	297	320	366	377	375	5,094
Sept. 31	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Oct. 1	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	3	10
2	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	3	13
3	...	...	24	6	...	...	...	...	...	...	...	...	...	...	...	...	17	47
4	2	...	53	18	...	...	...	...	...	...	...	...	...	...	...	...	38	111
5	14	...	62	31	...	...	...	...	...	...	...	5	...	...	...	...	24	136
6	34	...	26	22	...	...	...	...	...	...	...	15	...	...	...	...	103	200
7	17	...	28	29	...	...	...	...	...	...	...	36	...	...	...	...	14	124
8	16	...	16	7	...	...	...	...	...	...	...	29	...	...	...	...	39	107
9	21	...	2	18	...	...	...	...	...	...	...	17	...	...	...	...	71	129
10	9	...	3	6	...	...	...	...	...	7	...	14	...	...	...	10	34	83
11	12	...	1	4	...	...	...	...	...	24	...	8	...	...	...	9	8	66
12	15	...	1	8	...	...	...	...	...	59	4	4	...	...	...	19	4	114
13	6	4	...	1	...	...	...	...	...	43	12	6	...	...	...	11	...	83
14	4	26	1	2	...	...	...	...	...	62	28	2	...	...	...	9	1	135
15	2	72	...	1	...	...	...	...	...	43	49	1	...	...	...	22	...	190
16	...	96	1	1	...	...	...	...	...	33	38	3	3	...	...	23	...	198
17	...	83	...	1	...	...	...	...	...	21	15	2	12	...	...	30	...	164
18	2	32	...	...	...	...	...	...	...	27	16	4	42	...	...	38	...	161
19	...	36	...	...	...	...	...	...	...	10	21	1	38	4	...	14	...	124
20	1	21	...	...	...	...	...	...	...	6	4	1	28	19	...	16	...	96
21	...	11	...	...	...	...	...	1	...	4	...	...	18	62	...	28	...	124
22	...	6	...	...	...	...	...	6	...	6	2	...	14	45	...	16	...	95
23	...	8	...	...	...	...	...	35	5	...	1	...	21	28	...	2	...	100
24	...	5	...	...	...	...	...	48	21	2	...	...	12	19	...	8	...	115
25	...	4	...	...	...	...	...	41	38	1	...	...	4	12	...	2	...	102
26	...	...	...	...	...	...	...	46	35	2	...	...	8	8	...	13	...	112
27	...	...	...	...	...	...	...	32	31	1	...	...	...	1	...	2	...	67
28	...	3	...	...	...	...	...	23	14	...	...	...	1	...	...	6	...	47
29	...	...	...	...	...	...	...	21	10	1	...	...	1	...	...	2	...	35
30	...	...	...	...	...	...	...	17	21	...	...	...	1	...	...	...	...	39
31	...	...	...	...	...	...	...	14	6	...	...	...	...	...	...	...	...	20
Nov. 1	...	...	...	...	...	...	1	10	4	...	...	...	...	...	...	...	...	15
2	...	...	...	...	...	...	1	6	1	...	...	...	...	...	...	...	...	8
3	...	...	...	...	...	4	3	4	2	...	...	...	...	...	...	...	...	13
4	...	...	...	...	...	22	41	1	...	...	...	...	...	...	...	...	...	64
5	...	...	...	...	...	37	26	...	...	...	...	...	...	...	...	...	...	63
6	...	...	...	...	...	34	28	2	...	...	...	...	...	...	...	...	...	64
7	...	...	...	...	...	29	31	...	...	...	...	...	...	...	...	...	...	60
8	...	...	...	...	...	19	14	...	...	...	...	...	...	...	5	...	...	38
9	...	...	...	...	...	15	8	...	...	...	...	...	...	...	11	...	...	34
10	...	...	...	...	...	12	15	...	...	...	...	...	...	...	26	...	...	53
11	...	...	...	...	...	18	10	...	...	...	...	...	...	...	54	...	...	82
12	...	...	...	...	...	6	4	...	...	...	...	...	...	...	34	...	...	44
13	...	...	...	...	...	3	3	...	...	...	...	...	...	...	19	...	...	25
14	...	...	...	...	...	4	1	...	...	...	...	...	...	...	18	...	...	23
15	...	...	...	...	...	1	...	...	...	...	...	...	...	...	8	...	...	9
16	...	...	...	...	...	1	...	...	...	...	...	...	...	...	4	...	...	5
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
18	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1
19	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	2
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0
21	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
24	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Mortality	155	407	238	155	0	207	188	307	188	352	190	148	203	198	182	280	359	3,757
Mortality (%)	58.1	86.2	85.0	82.4	0.0	68.5	60.1	92.2	66.7	85.0	63.3	70.5	68.4	61.9	49.7	74.3	95.7	73.8

YC = Young cocks. YH = Young hens. H&C = Young hens and cocks. Yr. H = Yearling hens.

decided to vaccinate most of the 1946 crop as a possible means of preventing a recurrence of the disease. Accordingly, on June 27, 800 birds that were 5 weeks and 2 days old each received 0.1 cc. intramuscularly.* On July 3, a second lot of 1,600 birds, now 6 weeks and 2 days old, was similarly treated. Thereafter, the management obtained vaccine and treated all the young stock except the birds in pens 1 and 2 of house B which were the only controls left on the farm.

By the same token, the owner of the New Gretna farm wished to try an experimental vaccination on a part of his birds. Eleven-day-old embryonated eggs were inoculated on July 2 with a strain of the Forked River virus. All embryos were dead within twenty-four hours, and the harvested material was ground in a Waring blender, formalinized at 0.4 per cent, and stored in the refrigerator. A small sample was withdrawn four days later and the supernatant fluid after centrifugation was demonstrated by egg inoculation to contain active virus. However, when the same was tested again on July 30, no virus could be found. On August 6, two lots of birds hatched May 24 and June 14, and containing 360 and 165, respectively, were injected intramuscularly with 0.4 cc. of the inactivated virus vaccine. At the time of vaccination, the owner reported that he had already lost a couple of birds showing paralysis so that very probably the annual outbreak had already begun.

The results of vaccination on both farms are recorded below.

New Gretna Outbreak, 1946.—On September 12, the owner sent 3 dead birds with no history except that they were from the group vaccinated on August 6. The autopsy was negative except that all of the birds had cecal worms, two species in 1 bird, and 1 bird had three pairs of gapeworms. Brain tissue was removed from each bird aseptically and frozen. Five days later each tissue was suspended and inoculated in a dose of 0.2 cc. into 11-day-old eggs. Of 6 eggs inoculated with one sample, 4 of the embryos were dead within twenty-four hours and 2 within thirty-six hours. The second suspension killed 3 embryos within twenty-four hours and 2 within thirty-six hours. Of the 5 eggs inoculated with the third suspension, only 2 embryos died and these within twenty-four hours. The other 3 embryos were alive when the eggs were opened eight days after inoculation. That the 2 embryo deaths were specific was shown on September 24 when a subinoculation resulted in death, within twenty-four hours, of the 3 embryos inoculated. A second passage on September 24 with a 24-hour dead embryo from each of the other 2 birds likewise killed all embryos within twenty-four hours. Thus, virus was recovered from 3 birds said to have come from the vaccinated group.

Mortality figures in vaccinated and nonvaccinated birds on this farm are still not available, although these were requested. The only information supplied was that the disease appeared in both vaccinated lots on August 11, and that in the smaller lot the daily mortality through August 16 was 3, 2, 4, 3, 1, and 5 birds, and in the larger group 3, 3, 4, 3, 5, and 2 birds, respectively. The disease had continued in both lots, but no information was given as to the total loss. With reference to nonvaccinated birds, the owner wrote that he had lost these as in other years with no information as to date of beginning or total mortality. Since 2 paralyzed birds had already died before vaccination, it is evident that the disease had already started and that vaccination could have had little influence on the outcome. On the other hand, the dead birds received on September 12 and said to have come from the vaccinated group had at least a month in which to develop an immunity from the vaccination done on August 6.

On previous occasions we have noted the presence of gapeworms in pheasants dead of encephalomyelitis and mentioned the possibility of the virus being carried by these through the medium of the earthworm, which may serve as an intermediate host. The gapeworms from bird 1 were ground in broth, filtered through a Berkefeld V filter, and inoculated into embryonated eggs with negative results. Likewise, the two species of cecal worms from bird 2 and the cecal worms from bird 3 were ground separately, filtered, and inoculated with negative results.

Forked River Outbreak, 1946.—The outcome in nonvaccinated and vaccinated birds at Forked River in 1946 was rather spectacular in that the disease did not appear in any vaccinated pen. On the other hand,

*A supply of vaccine (eastern type) was donated by the Lederle Laboratories.

the disease broke out in 486 nonvaccinated young cocks in pen 1 of house B on Oct. 3, 1946. Last year this pen housed 210 young cocks, and the disease appeared in them on October 5 and lasted till October 20, killing 148 (70.5%) of the population. The remaining birds were held in this pen until March, 1946, when the pen was emptied and the runs were disked, harrowed, and planted with a mixture of rape, millet, oats, and sunflower seeds. In June, 1946, some young birds were placed in this pen and held until they were liberated early in September. Then on September 15 486 young cocks were placed in the pen. The rest of the population from which these were taken remained in a brooder house and were never affected. The daily mortality in the 486 birds is given in table 2.

An additional 5 birds died early in November, making a total loss of 374 (77%). It will be seen that the mortality followed the usual pattern and again suggests spread by contact. At the time of the outbreak, pens 2 and 3 of house B contained females, pens 4 and 6 contained a mixed population of males and females, and pen 5 contained males. When the disease began in pen 1, none of the birds in house B had been vaccinated, but the management promptly vaccinated all the birds in the house except those in pen 2. Thus, pen 2 escaped the disease although it was not vaccinated. A heavy infestation of mosquitoes was noticed for the first time during the week prior to the outbreak. It was also reported that the birds in pen 1 had suffered the greatest loss of feathers as a result of picking. Conceivably, a denuded bird would be more susceptible to the attacks of mosquitoes, which might account for the appearance of the disease in this pen. We have previously recorded that encephalomyelitis began in pens soon after vegetation was consumed and the birds began picking.

TABLE 2—Daily Mortality in Nonvaccinated Pen

Date	Mortality
October 3	2
4	3
5	18
6	37
7	70
8	64
9	35
10	32
11	5
12	8
13	8
14	5
15	11
16	5
17	10
18	5
19	5
20	8
21	5
22	5
23	4
24	5
25	7
26	5
27	4
28	1
30	2
Total	369

Four vaccinated females were brought to the laboratory on August 21 to be tested for neutralizing antibodies. Two of these birds were bled on October 8 and 19 and the serums tested on October 22, with the result that one serum neutralized a single fatal egg dose.

That the losses in pen 1 were due to encephalomyelitis was easily demonstrated by egg inoculation with brain suspensions of the 4 birds presented on October 7. Before the birds were killed, each was bled from the heart.

The brain suspensions were first inoculated on October 18, and a second passage was made on October 28. The suspension of brain 1 killed 2 embryos within thirty-six, a third in sixty hours, while the fourth embryo was still alive seven days later when it was destroyed. A 36-hour dead embryo above supplied inoculum for the second passage and killed 2 embryos within twenty-four hours and the third in thirty-six hours. The suspension of brain 2 killed the 3 embryos within twenty-four hours on primary passage and 2 of the 3 on secondary passage, while the third embryo died within thirty-six hours. The suspension of brain 3 killed the 3 embryos in each passage within twenty-four hours. The suspension of brain 4 killed 3 embryos within twenty-four hours and the fourth within thirty-six hours. This latter embryo supplied inoculum for the second passage, in which 2 embryos died within twenty-four hours and the third within thirty-six hours. All eggs in both passages showed typical changes and were bacteriologically sterile at harvest.

It was not possible to demonstrate virus in the serums of these 4 birds. That from bird 1 was inoculated on October 18 and the serums from the remaining 3 on October 22. These negative results correspond

with those on other occasions when serums have been inoculated.

The disease also occurred in horses in New Jersey in 1945.[5] Twenty-six horses were reported affected with 100 per cent mortality. The first case occurred in August and the last in October.

The paralytic symptoms in encephalomyelitis in pheasants are quite typical and when encountered in late summer and fall in New Jersey are highly diagnostic. However, an experience taught us that an otherwise typical outbreak, as regards symptoms, season, and mortality, occurring in Pike County, Pa., was caused by some agent other than encephalomyelitis virus. The disease began on Oct. 4, 1945, in a pen of 1,500 young pheasants, and the daily mortality to October 11 was: 56, 125, 100, 150, 67, 47, 12, and 5 birds, respectively, for a total of 562. Two live and 2 dead birds were presented on October 9. One bird showed leg weakness, and both live birds appeared to suffer from impaired vision. The autopsy revealed no anatomic cause for death. Brain tissue was collected aseptically from each bird and the live ones were bled. The brain tissue suspensions, as well as blood serum inoculated into embryonated eggs, gave negative results.

DISCUSSION

The five outbreaks here recorded bring the total to 13 definitely diagnosed in New Jersey by recovery of the virus.

On two farms (Forked River and New Gretna), the disease has shown the capacity to become enzoötic. At Forked River it probably occurred in 1937 and 1938 but was not definitely diagnosed until 1939 and did not reappear until 1945, recurring again in 1946. As pointed out previously, birds transferred from Forked River to Sparta, N. J., in 1939 were probably responsible for the appearance of the disease in a population of pheasants there. Similarly, there is the history of a transfer of Forked River birds to the New Gretna farm prior to the first appearance of the disease there in 1943. However, New Gretna is in an area where the disease is enzoötic in horses, but Sparta is outside of this area.

This year it was learned that, contrary to the history given at the time, birds from Forked River were purchased by the farm at Deans, N. J., prior to the appearance of the disease there in 1944.

The New Gretna farm, whether infected from Forked River or elsewhere, has suffered an annual outbreak since 1943.

The epizoötiology of the disease as exemplified by the extensive 1945 Forked River outbreak is difficult to explain on the basis of insect transmission, since most of the pens did not become infected simultaneously. Thus, in house A, the disease began in pen 3 on August 31, but did not start in pen 7 until November 3. Again, in house B the first pen was stricken October 5 and the last on November 8. Finally, the 50 birds in pen 6 of house A escaped the infection entirely.

The mortality curve in each pen followed about the same pattern and suggests transmission other than by insects. It may be that the introduction of the disease in each pen is dependent on an insect vector and that thereafter spread is by direct contact. The irregular appearance of the disease in a house of several pens may be dependent on the degree of picking, which would affect the birds' vulnerability to the attacks of an insect.

The possibility of the virus wintering over in the egg of a parasite or in the intermediate host of a parasite deserves consideration. However, the examination of cecal worms from 2 birds and the gapeworms from a third gave negative results.

Considering the wide distribution of pheasants, the 13 outbreaks now recorded in New Jersey are in contrast with the low incidence of the disease in birds elsewhere. In fact, aside from the 1 pheasant case in Connecticut described by Tyzzer *et al.*,[6] the pigeon case in Massachusetts diagnosed by Fothergill and Dingle,[7] and the recovery of the western type of virus from a prairie chicken by Cox[8] in North Dakota, the literature is devoid of reports of natural outbreaks.

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Malignant Lymphoma in a Cow

The subject, a valuable registered 4-year-old Guernsey cow, suffered an acute illness early in the fall of 1946. Her temperature was about 105 F.; there was cessation of milk flow and symptoms of peritonitis. She received 125 cc. of phenyl mercuric nitrate and was put on a three-day sulfanilamide treatment. The white cell count of over 120,000 was verified by another veterinarian.

The cow was reported much better next day, and her recovery seemed complete in three or four days. Several months later she calved. In the early spring the owner reported that she was not producing satisfactorily and that he suspected some disturbance in general health. Physical examination and urine tests revealed nothing abnormal. The red cell count was about 6,000,000; the Tallqvist determination was around 80 per cent; the white cell count was 35,000; and a differential count showed 90 per cent of the cells to be lymphocytes. Subsequent cell counts at about monthly intervals showed a decline of white cells from 28,000 to 7,000, and red cells from 3,500,000 to 3,000,000.

As the white cell count approached normal, the cow improved in condition and production. There seemed to be some response to the treatment which had been of an alterative and hematonic nature.

In August, the white count was back to 150,000, but the red cells stayed about 3,000,000. This count was made by a commercial laboratory, and they found the hemoglobin to be about 50 per cent. About the middle of September, her condition began to decline, and she died suddenly Sept. 18, 1947.

Postmortem examination revealed a peculiar hemorrhagic peritonitis. Apparently, hemorrhage had occurred in a somewhat regular pattern over the pleura, resulting in oblong clots of blood approximately an inch and a half long on the omentum, and considerable fresh clotted blood in the ventral part of the pleural cavity. The spleen was several times the normal size, adhered to all surrounding structures, and the parenchyma was nearly fluid. Lymph nodes were about 2 or 3 in. long. The liver showed degeneration, the heart was enlarged, hemorrhagic but firm, and there were several greatly enlarged hemolymph nodes at the thoracic inlet.

Tissues were forwarded by Dr. F. X. McArthur of Boise, Idaho, to Dr. C. L. Davis, U. S. BAI, Denver, Colo., who replied as follows:

The lymph nodes show a diffuse infiltration of lymphoid cells with obliteration of the nodal pattern. The liver is also diffusely infiltrated with tumor cells of the lymphocytic series and are a little better preserved than in the lymph nodes. Definite liver structures could not be made out however, due to postmortem changes, but occasional blood vessels showed a marked increase of lymphocytes in the blood contained. This conforms with the leucemic blood picture determined by the blood count.

This condition is not infrequently referred to as leucemia, but there is some doubt that a true leucemia actually exists in animals. Many animal pathologists consider this an expression of neoplasia and call it malignant lymphoma. Feldman describes this condition as leucemic lymphocytoma. We are coding this case a malignant lymphoma.—*L. M. Koger, D.V.M., Ontario, Ore.*

Chemotherapy of Brucellosis

Important as it would be to sterilize the bodies of farm animals of Brucella organisms, the hope of doing so with the combined use of sulfonamides and antibiotic agents was given a setback by trials of sulfadiazine and streptomycin in human cases reported in the *Journal of the American Medical Association* (Dec. 20) by C. Wesley Eisele and Norman B. McCullough of Chicago, who noted no effect on the course, fever, or septicemia of a case carefully selected for the test.

The cases of undulant fever ordinarily seen in this country, these authors state, are too erratic and unpredictable in course and duration to measure with the yardstick of the clinic. Favorable results can be wrongly attributed to the use of drugs.

Over 3 million lb. of DDT is being produced monthly in the United States.—*USDA.*

Symposium on Distemperoid Virus (Green) in Practice

At the Cincinnati Session of the Association, Aug. 18-21, 1947, the following symposium was presented in the Section on Small Animals. The members of the symposium were: Dr. J. A. Edgett, Hartford, Conn., moderator; Dr. H. H. Groth, San Mateo, Calif.; Dr. John LaFrance, Binghamton, N. Y.; Dr. E. F. Schroeder, Boston, Mass.; and Dr. C. P. Zepp, New York, N. Y.

I.—JAMES A. EDGETT, D.V.M.

Hartford, Connecticut

Twenty well-known small animal veterinarians, spread from north to south and coast to coast, were asked if they used distemperoid virus. My poll was occasioned by the fact that on Dec. 10, 1946, I had inoculated a 26 lb., 4-month-old Boxer puppy with 25 mg. of distemperoid virus after first treating him for tapeworms. Other than the tapeworm segments present, the fecal examination had been negative. The pup seemed in excellent health, temperature normal, and the history was completely negative. Four days later, the owner brought the dog to the hospital saying that he had been having convulsions and volunteered the information that he had had a series of convulsions two months previously. I prescribed phenobarbital and Dilantin sodium, added crude casein to his diet, and kept my fingers crossed. He had no further convulsions, his temperature remained normal, and he was discharged on December 16 with directions to continue the treatment I had begun. On December 20 I left for a two-week vacation trip to Canada, returning January 6. On January 7 an irate client telephoned to engage in a one-sided conversation to which I listened hoping for a chance to get in a word. But the monologue ended by the bang of a 'phone slammed on the hook. The dog had developed severe convulsions and died. The distemperoid virus killed the dog, and its use should be discontinued. According to the lady, the "one-shot" inoculation killed nearly every dog that got it.

While I never seriously considered abandoning my practice, I did wonder if, by chance, some fundamental scientific fact had completely escaped me. So I wrote 20 letters and received 19 replies. Seventeen men replied that they did use distemperoid virus for immunizing dogs against distemper. About half of them indicated that they also used it for treatment. I wish now that I had polled 100 practitioners. The statistics would have been much more significant. The implied 90 per cent acceptance of distemperoid virus might well have been greatly modified, and a theory might have been strengthened; that is, in areas where distemperoid virus is in disrepute, the fault lies in the changed nature of the disease in those areas—the virus of Carré has become more virulent, or more neurotrophic, or multiple virus infections are the rule.

I was interested to read in the August, 1947, issue of the JOURNAL (p. 129) that such a mutation is thought to have occurred in France where canine distemper is now very definitely atypical.

I'm going to generalize a bit. My fellow members in this symposium are well qualified to present statistics and better able than I to deliver them. What I have to say is in no way original. As I see it, control and possible elimination of canine distemper is the biggest single problem facing small animal veterinarians today. Eradication of rabies would be a far more important contribution for us to make to the world. No one would seriously question that. However, control or eradication of rabies is not the concern of the small animal veterinarian alone, but of the profession as a whole, of the medical profession, and of the general public. By constant repetition, the public can learn to realize that rabies can be controlled by strict licensing, vaccination, and quarantine of dogs.

That, though, is still far in the future. We are aware that canine distemper is our first problem. Canine distemper is on the program of nearly every veterinary meeting, and the presentations are usually well attended. Those who are absent inquire later to learn if anything new has been added to distemperology. We not only talk about distemper, we do something about it. We have adopted distemperoid virus as an immunizing agent, and as a therapeutic measure. I believe this is a decided step forward.

Using varioloid virus, the medical profession has successfully dealt with vari-

ola. Smallpox, which once accounted for thousands of deaths yearly—to say nothing of the suffering and disfigurement of those who survived—has virtually been eliminated. Can we accomplish the same result in immunizing against canine distemper by employing distemperoid virus?

When I graduated from veterinary college, I knew a little about many subjects, including bacteriology. That I knew no more about viruses than I did was neither my fault nor my professors'. Not a great deal was known about viruses *per se*. We knew about such virus diseases as rabies, hog cholera, foot-and-mouth disease, equine encephalomyelitis, and canine distemper, to name a few, but not much about viruses themselves.

In a paper entitled, "Newer Aspects of Virus Diseases of Dogs," published in the August, 1942, issue of *North American Veterinarian*, Dr. R. G. Green of the University of Minnesota summarized all that I had known about viruses and acquainted me with much that I had not known—particularly as to their marked histologic and zoölogic adaptation or specialization. This specialization goes far beyond that of the tapeworm which, as we all learned in parasitology, no longer needing a digestive tract, now lives and reproduces without one.

Viruses are specialized not only to intracellular existence but to type of cell and, to a lesser degree, to the species of animal in which the cell occurs.

Due to the intracellular life of viruses, diseases caused by them are difficult to treat. They are resistant to chemotherapy. Neither the sulfonamides nor antibiotic agents seem to affect them because drugs and antibiotic agents do not penetrate farther than the tissue fluids. Such penetration is sufficient to cope with bacterial diseases, for while bacteria destroy cells, they seldom actually invade them. Viruses, as far as is known, are always intracellular. Such specialization, however, also imposes limitations while conferring benefits.

The histologic specialization of viruses was one of two fundamental principles or concepts utilized by Dr. Green in rationalizing his cell block theory of immunization. Immunologists are agreed that inoculation with a live virus confers a greater degree of immunity than does inoculation with a killed virus. In fact, it is believed that to have immunity against a virus disease, there must be a continuing infection. The virus which has become nonpathogenic simply continues to live on in the cells. This theory explains why infection with the virus of the common cold does not confer immunity. The virus attacks the epithelial cells of the respiratory tract. These cells die and are replaced so rapidly that lasting immunity is not possible.

To get back to inoculation with live virus: the immunizing virus frequently has proved as lethal as the one being immunized against. This is where the second principle comes into play. Viruses are capable of modification. It is axiomatic that every living thing today has undergone changes in the past and probably is capable of undergoing still further changes in the future. Whether these changes are results of simple evolution (ability to adapt slowly to cope with changing conditions), or of mutation (spontaneous appearance of an entirely new species) is not of fundamental importance. Both are manifestations of the organisms' fight to resist extinction. Viruses are anything but extinct—there are plenty of 1948 models to plague us.

Three men have made great contributions to knowledge of viruses and virus-caused diseases: Jenner deduced cause by observing effect. In using vaccinia or varioloid virus to protect man against variola, he employed a virus which apparently had undergone natural zoölogical modification. Pasteur, dealing with a virus which exhibits very little, if any, zoölogical preference, still was able to modify it somewhat in developing his rabies fixed virus. Green has modified a virus by animal passage so that pathogenicity was lost yet immunizing power retained. This principle is borne out by Dr. Baker's paper on the hog-cholera virus' modification by passage through rabbits.

It in no wise detracts from the genius of Pasteur, or the acumen of Jenner, to say that Green's contribution is equally notable.

2.—HAROLD GROTH, D.V.M.

San Mateo, California

In discussing this subject, it is necessary to have a clear understanding of the virus of Carré, for without visualizing the versatile behavior of this virus, we are incapable of analyzing accurately the value of any

biologic product used to prevent canine distemper.

Canine distemper virus can produce a most deadly epizoötic disease in dogs. Biologists explain that this virus is a living organism, parasitic in nature, and can operate only in specific living body cells. In some instances, it produces in the dog infection of such a low grade that illness is not recognized. This phenomenon is of great value since it renders the dog immune to an increased virulence of the virus.

Serious epizoötics arise from: (1) susceptible dogs that have not been exposed to the virus, and (2) a new virus produced by a change in the old form.

It is believed that susceptible dogs can contract the virus from immune carriers, immunized through repeated exposures. Periods of low virulence may run for months, perhaps years, in some localities. The serious epizoötics cause the most concern. During these periods, the virus is multiplying rapidly and changing, so that dogs immune to low grade infection are vulnerable to the changed new forms of virus that have been developing. The virus eventually destroys itself by destroying some of its victims and leaving others immune. Thus, and fortunately, virus runs its course leaving the immune survivors at least until the next epizoötic gets underway.

Having these characteristics in mind, it seems reasonable to say that distemper immunity is relative, and that vaccination has its limitations. The belief that a low grade infection produces a certain degree of immunity led me to use the distemperoid virus method of vaccination.

Preventive vaccination seems to lessen the number of susceptibles, thereby reducing the frequency of epizoötics which seem to run rampant.

In using distemperoid virus, I am concerned with the health and nutrition of the individual, and I prefer not to use it during the teething age. I favor repeating its use if it has been given before teething. I have seen a large number of susceptible animals that were protected against ordinary or moderate virulence by vaccination, while unvaccinated controls in the same ward contracted the disease.

In concluding, I wish to emphasize the changing characteristics of distemper virus. In my opinion, this accounts for the discrepancies in the results of vaccinations in various localities.

3.—JOHN LaFRANCE, D.V.M.

Binghamton, New York

I have been interested in canine distemper immunization from a practitioner's standpoint for about twenty-five years. It has been suggested that I deal with a few immunization statistics. Statistics can be boring, but I have compiled a few facts which should be of interest. In regard to immunizing dogs against distemper, I have listed three important factors:

1) Know the potential number of dogs to be immunized in your community.

2) Find a safe, simple, and reliable immunizing agent.

3) Check the reactions and the number of dogs developing a permanent immunity.

To illustrate the first point, here are some statistics from the August, 1947, issue of *Dog World* pertaining to the average number of dog owners as compiled by *Collier's Weekly*. They report that dogs are owned in 58 per cent of the homes in communities of 2,500 population; 45 per cent of the homes in communities of 2,500 to 25,000; 38 per cent of the homes in communities of 25,000 to 100,000; 35 per cent of the homes in communities of 100,000 to 500,000; and 28 per cent of the homes in communities of 500,000 and up. These figures are rather significant.

The second phase of this subject, the finding of a safe, simple, and reliable product, has been a stumbling block from all angles. Over a number of years, we have tried the methods of distemper immunization suggested by the biological houses. Most of them have created barriers to the practitioner—for example, insufficient future immunization, reactions following administration, thoughtlessness on the owner's part for neglecting to submit the dog on a specified day for subsequent inoculations, etc.

During 1943, we started cautiously using distemperoid virus on our own field trial dogs. The results were phenomenal, as often happens with the application of a new drug or biological product. It was so encouraging that we started using it on some clients' dogs. To date we have used more than 1,300

doses. We are better satisfied with the results of distemperoid virus, and our clients must be also, for we have used 110 more doses so far this year than we used in the entire year of 1946.

Concerning the reactions as a result of vaccination and the lifetime immunization produced by distemperoid, we have followed the successful practice of vaccinating dogs at 3½ to 4 months of age. Our reason is that puppies taken into a new home must readjust themselves. They also experience a change of water, generally a change of food, and are passing through a trying stage of worming and teething.

About half of the dogs brought to our office for distemper inoculation are refused at the first call because of ill health. We do, however, vaccinate a substantial percentage later and find that the vaccine is not discredited.

In conclusion, a dog vaccinated against distemper is a better prospect for the veterinarian's care at a future date. Distemperoid virus immunization causes a small percentage of dogs to develop a vaccination reaction, but permanent immunization will be produced in about 96 per cent of all dogs so vaccinated.

4.—E. F. SCHROEDER, D.V.M.

Boston, Massachusetts

The use of distemperoid virus for prophylactic purposes in the Angell Memorial Animal Hospital and Clinic in 1946 have given the following results: Of 248 cases that received prophylactic injection, 144 showed no reaction, 48 a slight reaction, 12 a severe reaction, 6 died with meningo-encephalitis, and 1 died with distemper. The 6 meningo-encephalitis cases became ill and died within a short time after being inoculated. The 1 actual distemper case died four and a half months later, having apparently been all right in the interim. This leaves 37 cases out of a total of 248 unaccounted for, either because owners could not be contacted by telephone or did not reply to our letters of inquiry. (*See* the accompanying table.)

We consider the distemperoid virus, in these cases, 96.7 per cent effective. We realize that this is a very favorable finding, but there is no other way to evaluate the effectiveness. It might be assumed that, of the 37 cases unaccounted for, some may have died of distemper or other complications, but since no word has been received from the owners in these cases, we could also assume that these animals are normal in so far as distemper may be concerned. From our experience in treating animals in the out-clinic department, and in the Hospital, I believe we are more apt to hear from owners of pets when things go wrong, rather than to have them call us voluntarily to tell us that their pets are all right.

Group	Reaction	Dogs	% of cases
1	No reaction.	144	68.25
2	Mild to moderate.	48	22.75
3	Severe.	12	5.69
4	Died from meningo-encephalitis apparently induced by distemperoid virus.	6	2.84
5	Died from distemper contracted 4½ mo. after vaccination.	1	.47
		211	100.00

From limited use of distemperoid virus in therapeutic treatment, we find that when an early diagnosis is possible and double dosage is used the end results have been more than favorable. We are not ready as yet to present actual figures, but we do hope to have an enumeration at the end of the year.

5.—C. P. ZEPP, SR., D.V.M.

New York, New York

Before I present my records of cases treated, a description of virus diseases as the clinician sees and understands them may help explain the reasoning for my procedure in the therapeutic use of distemperoid virus, and in handling the distemper problem in our hospitals.

It is recognized that the virus of Carré principally attacks the epithelial cells of the dog. It has also been observed that virulence increases as the virus develops in the host, and that the virus migrates from one epithelial area to another. We, in practice, could have observed this if we had observed our distemper cases carefully. We could have observed that the first symptom of distemper is usually in the nose (sneezing), or throat (cough), or skin (pustules). The mouth and throat usually are the first

Chief, Angell Memorial Animal Hospital, Boston, Mass.

epithelial cell areas attacked by the virus. Following that, the intestinal symptoms appear and many other complications such as discharge of pus from the nose and eyes occur, showing invasion of those areas. This action of viruses has an important bearing on the use of distemperoid virus for therapy.

The therapeutic value of modified viruses is rather new. The theory of cell block or cell interference is the basis for its value in therapy. In other words, we try to infiltrate the epithelial cell with nonvirulent virus before the virulent virus gets there. I think the value of viruses for cell block is now well recognized. This value was corroborated by the rinderpest work done during the war period.

Accepting the theories that the virus of distemper migrates from cell to cell, that it increases in virulence as it migrates, and of cell interference or block, one can readily see the importance of distemperoid virus therapy in the early stages of distemper. This value is admitted by most veterinarians who have used it. I believe that distemperoid virus also has a value at all stages of the disease where the dog has enough resistance left so that the modified virus has an opportunity to be carried to the cells preventing the virulent virus from further weakening the dog.

THE USE OF DISTEMPEROID VIRUS ON THE QUESTIONABLE PUP

In New York City, at least half of the pups presented to us are questionable cases to diagnose or present a complication of diseases. The typical pup, in all likelihood, was exposed to distemper in a pet shop and also is suffering from deficiencies and worms. This type of pup presents a problem. We cannot immunize it against previous exposure to distemper with our present day procedures; nor can we immunize a wormy, deficient pup because if the deficiencies and worms cause convulsions or unthrift, we and the immunization product would be discredited.

No matter how much we dislike to see such a dog, our clients have purchased the pup and it is our duty to help them raise it. As a rule, such a pup cannot be returned for a better one. Here distemperoid virus has come to our rescue since it produces a permanent immunization and has therapeutic value. By using a therapeutic dose (2 mg./lb. weight) in these questionable cases, we can play safe both ways by immunizing the dog if that is all that is required or therapeutically treating the developing case of distemper if that is required.

This procedure is advisable in cases of wormy or emaciated pups, for they do not have much chance of growing to maturity unless distemper is taken out of the picture. We can conclude this from the fact that only 30 per cent of the pups born reach maturity.

One who plans to use distemperoid virus for both immunization and therapy in questionable cases must thoroughly explain its possibilities to the owner so that the procedure will be understood and not regarded as only an immunizing injection. One cannot save all questionable cases with the distemperoid virus, but we certainly saved fewer with the old methods.

In one series, I had 251 dogs suffering with deficiencies or mild worm infestations, dogs that offered great possibilities of being exposed, and only 242 good risks. In the 251 risk cases, I explained thoroughly to the owners my reasons for using distemperoid virus. To these dogs I gave 2 mg. per pound of body weight, which I consider a therapeutic dose in the early stages of distemper and also a quick immunizing dose.

I have records on 202 (80%) of the 251 risk cases because they were mostly ill dogs and needed further treatment. This afforded an opportunity to determine the outcome. Of this group of 202 poor risks, we lost 41 dogs (16%). The principal causes of death were convulsions and intestinal trouble. Some died from a complication of infections. But very few dogs died from what could be definitely diagnosed as uncomplicated distemper.

Previous experience with this type of dog leads me to believe that had I not given the distemperoid virus I would have lost half of these pups. They were poor risks and definite diagnosis was impossible. By administering 2 mg. per pound of body weight, I gave quick immunization to the unexposed and nondistemper cases, eliminating the possibility of distemper during the recovery period from deficiencies and parasitisms. The cases in the first stages of distemper were benefited and possibly saved by the early therapeutic dose.

Since July 1, 1946, I have treated 79 dogs, using 3 mg. per pound of body weight as a therapeutic dose. Of the 79 dogs, 11 were euthanized and 5 died naturally (20% mortality). The 79 dogs included all types of cases which we felt had a chance of recovery. Some very poor risks died before the virus could be

effective. Others may have been diagnosed incorrectly or incompletely.

Analyzing the results in the 79 dogs treated with distemperoid virus, I conclude that the results were good, since most that died had severe complications—worms or nervous conditions—but 63 of the cases termed poor risks got well, thus reducing the mortality to 20 per cent and shortening the period of illness.

I do not believe that the virus of Carré is the direct cause of convulsions or chorea, but I do believe that these are caused by deficiencies brought on by the improper metabolism of the dog. Very few dogs have developed nervous symptoms after the distemperoid virus therapy had an opportunity to be effective.

THERAPY

To treat distemper cases with distemperoid virus, I use 3 mg. per pound of body weight, never less than 50 mg. altogether. The whole dose is given at once and as early as possible. I know that the dose is large and the cost high, but if the owner can have a recovered dog without complications in a short time, he will not object to the cost. Moreover, if serum is used in treating distemper at the rate of 2 cc. per pound of body weight daily for three days as recommended, the cost of distemperoid virus is less than the cost of serum. For example: to treat a 40-lb. pup with serum for three days would require 240 cc. of serum at a cost of $5.50 per 100 cc.—a total of $13.20. Compare this to distemperoid virus at the rate of 3 mg. per pound or 120 mg. for a 40-lb. dog. At 10 cents per milligram, the dose would cost $12.00, a saving of $1.20 plus the saving of labor, breakage of syringes, etc., because the distemperoid virus is administered at one dose.

SUMMARY

My experience in using distemperoid virus therapeutically has convinced me that it offers the following advantages: (1) Response is rapid, with the illness period reduced to about one-third of the time required when serum is used. (2) Mortality is reduced to about one-half of that experienced with previous methods. (3) Complicating after-effects are greatly reduced and most of the dogs go home as desirable pets. (4) By blocking the spread of the virulent virus, the need for symptomatic treatment is reduced.

Brucellosis of the Withers

A saddle horse with fistula of the withers reacted to brucellosis. The fistula, on both sides, was about 10 in. across. Medication in the feed during the previous two years had done little good. I injected 10 cc. of outdated strain 19 at about the middle of the shoulder on one side. At twenty-four hours, the horse was off feed and very stiff. At seventy-two hours the horse seemed to feel all right and pus was running from the injection site. This continued for a month until the swelling of the wither on that side was completely gone. I then injected the other side with similar results. Today you cannot tell that the horse had a fistula. —*Wm. Hartnell, D.V.M., Genoa, Ill.*

Antistreptococcic Serum in the Treatment of Enzoötic Equine Encephalomyelitis

Notwithstanding that streptoccoci are not the initial agents and are obviously pathologic only after the primitive action of a filterable virus, it is nevertheless true that antistreptococcic serum brought about an immediate recession of the symptoms of acute and subacute attacks of equine encephalomyelytis in an outbreak that occurred recently in the Department of La Manche (France), according to a report by H. Adeline published in the *Bulletin de la Société Vétérinaire Pratique* (Abst. *Rev. Méd. Vét.*, Sept.-Oct., 1947: 460). The author used daily 40-cc. doses of antistreptoccoccic serum (Pasteur) intravenously. Early diagnosis and treatment are important. The presence of icterus among the vague early symptoms is an indication to start the treatment. Repeated doses of the serum for eight weeks was believed to be preventive. The rôle of streptococci in encephalitides is well known.

Two hundred and seventy-two recent tests performed by inspectors of the Food and Drug Administration show that considerable quantities of milk containing large amounts of filth are received by cheese factories.—*Am. J. Pub. Health, 37, (June, 1947): 732.*

Renal Coccidiosis and Gizzard Worm Infection in Geese

Two Toulouse geese, 2 months old, from a flock of 100 in a swampy area, were brought to this station from Auburn, Wash., on July 1, 1947, for a routine diagnosis. There had been a 50 per cent mortality in the two weeks prior to examination. According to the owner, the affected birds appeared drowsy and died quite suddenly. Autopsy revealed severe emaciation of both goslings. Bacteriologic cultures were negative. The kidneys had many yellowish white necrotic foci about 1 mm. in diameter distributed over the entire surface. Ground bits of kidney material revealed developmental forms of Coccidium and oöcysts. Mature oöcysts averaged 21 x 15 μ. Sections from the kidneys showed distention and erosion of approximately 20 per cent of the tubules by a large number of coccidia. These pathologic findings are similar to those of McNutt,[1] who found renal coccidiosis for the first time in the United States in 1929.

Numerous specimens of the gizard worm, *Amidostomum anseris*, were found in the gizzard. This nematode has been previously reported from Western Washington by Jerstad, [2, 3] in both domestic and wild anseriform birds.—*H. E. Adler,* B.S., D.V.M., and E. W. Moore, B.S., Puyallup, Wash.*

*Washington State Department of Agriculture, Division of Dairy and Livestock, Western Washington Experiment Station, Puyallup, Wash.

[1]McNutt, S. H.: Renal Coccidiosis of Geese. J.A.V.M.A., *75*, (1929) : 365.

[2]Jerstad, A. C.: The Gizzard Worm, *Amidostomum anseris*, of Geese in Western Washington. J.A.V.M.A., *89*, (1936) : 318.

[3]Jerstad, A. C.: Further Records of the Gizzard Worm, *Amidostomum anseris* in the State of Washington. J.A.V.M.A., *90*, (1937) : 785.

Penicillin Therapy.—Summed up and screened out from the printed reports, the optimum antibacterial action of penicillin is obtainable only by means of given doses repeated at given intervals over a given length of time. The single dose of penicillin appears to be a waste of that much material and time. For veterinary practice, the hope lies in researches on prolonging its action. The mixing of the drug with metals is the promising approach at the moment.

Pectin Retards Drug Excretion

Good results have attended the use of pectin, in lieu of oil and wax, as a penicillin vehicle, says *Science News Letter* (Oct. 4, 1947). Pectin inhibits the escape of penicillin from the body to about the same degree as oil and wax and does not predispose to such troublesome complications as pain and abscess at the site of injection. Its retarding effect on excretion is even more marked for streptomycin. Tests on laboratory animals show that pectin also prolongs the effects of adrenalin and ephedrine and has possibilities as a vehicle for prolonging the effect of sex hormones.

Thiamin in Fern Poisoning

A brief note in *Biological Abstracts* (May, 1947) on the apparent antidotal action of thiamin in fern poisoning of rats may be of interest to veterinarians, since it suggests a possible new approach in the treatment of fern poisoning in cattle. Weswig and coworkers at Oregon State College fed ground fern (*Pteris equilina*) to rats at a level of 40 per cent in the diet, with loss of weight and death resulting, but when thiamin was fed at the rate of 0.5 mg. per day, toxic effects of the fern were eliminated.

Inasmuch as there is now no known means of saving the life of cattle dying of fern poisoning, a trial with thiamin in these cases would impose no sacrifice, and it might give surprising results.

Vallee-Ringard Vaccine.—Cows vaccinated against paratuberculosis (Johne's disease) with the vaccine of Vallee and Ringard react to the tuberculin test and thereby confuse the control of tuberculosis. The Vallee-Ringard vaccine is a suspension of *Mycobacterium paratuberculosis* in olive oil, vaseline, and pumice stone. Injected subcutaneously, it causes a perdurable nodule at the cite of injection that protects the noninfected animal. In being absorbed instead of forming a nodule in the infected animal, the vaccine has diagnostic value. Its overall value is controversial.—*Prof. Jacob Jansen, Utrecht, Holland, J.A.V.M.A., January, 1948: 52-54.*

About 2,000 veterinarians in this country have facilities for hospitalizing dogs.—*The North American Veterinarian.*

NUTRITION

Nutrition Notes

Vitamin B_6 is involved in the metabolism of the amino acids.

Foxes and mink of all ages develop weakness, irritability, anemia, bloody diarrhea, and fatty liver when deprived of folic acid.

Young calves that do not get enough vitamin A the first three or four months usually die of scours or pneumonia.—*University of Illinois.*

Too little roughage appears to be part of the cause of bloat in sheep and cattle, according to a University of Illinois circular.

Swedish experiments show that young pigs digest the fat and protein of corn better than that of oats.

Recent studies at the University of Wisconsin showed that between 55 and 92 per cent of the folic acid in meat is destroyed in cooking.

The fact that only ruminants suffer from cobalt deficiency is construed as evidence that the bacteria essential to healthy digestion require cobalt for their growth.

Although protein in nutrition is an old study, there is an amazing lack of information as to the protein needs to maintain growth in any breed of dairy cattle.—*J. K. Loosli in Feedstuffs.*

Poultry raisers, more than the other branches of animal production, rely upon commercial feeds because a balanced dietary is not easy to make out of raw farm cereals.

Maryland experiment station studies demonstrated that New Hampshire chicks on a vitamin D deficient ration develop abnormal blackening at the base of the feathers.—*From Poultry Science.*

Dogs deprived of pyridoxin may develop hypochromic anemia.

Dehydrated sweet potatoes are gaining popularity in the southern states as a carbohydrate feed for livestock.

There is evidence that raw soybeans exert a detrimental effect either on provitamin A or on its utilization by cattle.—*J. Dairy. Sci.*

The colts that bring real money at the sales are fed grain as soon as they will eat it and are handled from the time they are babies.—*A. H. Davidson, Lexington, Ky.*

Workers at the Clayton Foundation for Research in Houston, Texas, have observed that nicotinic acid has a direct energizing effect on heart muscle.

University of California experiments reveal that almond hulls, which have a 25 per cent sugar content, can be converted into crude molasses for livestock.

Breast of chicken, besides being a tasty delicacy, is rich in the antipellagra vitamin (niacin) according to researches conducted by the U.S. BAI. The niacin concentration is highest in broilers and fryers—higher than in other meats assayed.

Colostrum Fat.—In a study of fatty acid composition at the Dairy Research Institute, Bangalore, India, colostrum fat from a number of cows, analyzed for chemical characteristics and fractionation, showed a gradual decrease in oleic acid and an increase in the low molecular fatty acids as lactation advanced. The colostrum fat on the first day was of a character intermediate between body fat and milk fat.

Soybeans in Swine Nutrition

The general use of raw soybeans, which began about twenty-five years ago, as a supplement to the corn ration has shifted to cooked or heated soybean-oil meal to avoid the production of soft pork but, because of its palatability, the processed meal should not be fed free-choice. The means of providing the minerals and vitamins required to make up a balanced ration are being worked out. Two thirds of a pound of soybean-oil meal daily is adequate to supply the protein needs of a hog. By mixing it with minerals, alfalfa meal, oats, or other less palatable feeds the mixture can be used in free-choice feeding. — *From C. M. Vestal, Purdue University, in Feedstuffs, Nov. 29, 1947.*

Coffee Bean Pulp Replaces Corn for Dairy Cows

Experiments conducted jointly by American and El Salvador government technicians in the latter country showed that coffee pulp—the fleshy covering of the coffee bean—can be substituted, pound for pound, for corn as dairy cattle feed. Its digestibility approaches that of corn. It is not palatable when fed alone, but is readily consumed when mixed with molasses. Extensive feeding tests with this product will be conducted at Beltsville, Md., and at state experiment stations. The process for converting coffee pulp into feed is described as simple and economically practicable. Up to now, most of the pulp has been disposed of as waste.

It is estimated that if all the available coffee bean pulp in the Western Hemisphere was converted into feed, it would replace about 34 million bushels of corn.

Preservation of Carotene in Feeds

Halverson and Hart, of the University of Wisconsin, observed that when dehydrated alfalfa and cereal grasses contained 12 to 20 per cent of moisture and were sealed in airtight containers, there was no loss of carotene at storage temperatures of 70 to 80 F., whereas without sufficient moisture and airtight packing, rapid loss occurred at the same temperatures. They have worked out a fundamental production process which, with certain ramifications, may prove practical in preventing carotene deterioration in manufactured feeds, especially dehydrated alfalfa. In *Feedstuffs* (Aug. 16, 1947), these workers point up the seriousness of carotene losses in feeds and suggest that the industry investigate the practicability of this preservation process, which has been filed for patent, with rights assigned to the Wisconsin Alumni Research Foundation.

Studies at the University of Maryland demonstrated that the feeding of certain amino acids, especially glycine, arginine, and alanine, to chicks on a low nicotinic acid, low tryptophane diet inhibited growth and produced symptoms similar to those seen in nicotinic acid deficiency. Addition of nicotinic acid to the ration prevented the symptoms and allowed normal growth, thus suggesting that this vitamin is involved in the metabolism of amino acids.

Nutrition in Dairy Science*

Globulin Protein.—Analyses of globulin protein isolated from bovine colostrum indicate a striking similarity in amino acid composition to purified human serum *gamma* globulin. — *Hansen and Phillips (Wis.).*

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Lactation Factor.—Corn grain and ear corn silage contain an unknown factor, not present in grainless corn silage, that stimulated milk production. — *Dun et al. (Mich.).*

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Digestion of Roughage. — Studies with finely ground alfalfa showed that rumination may not be essential to the proper digestion of roughage if fine enough not to require remastication.—*Swanson and Ragsdale (Mo.).*

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Prevention of Rickets.—Where barn-dried hay and wilted grass silage are fed at the usual levels of roughage feeding, there is probably enough vitamin D present to prevent rickets in growing calves. — *Moore and Thomas (USDA).*

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Distillery Byproducts in Dairy Rations.—Distiller's dried solubles and distiller's dried grains with solubles appear to be a satisfactory substitute for linseed meal, dried brewer's yeast, and dried whey in the rations of calves. — *Schabinger and Knodt (Pa.).*

*Gleanings from papers presented before the forty-second annual meeting of the American Dairy Science Association, Guelph, Ont., June 24-26, 1947: based on abstracts in *J. Dairy Sci., 30,* (Aug. 1947).

EDITORIAL

Time for Plain Talk on Foot-and-Mouth Disease

A big question in the livestock press, at meetings of livestock producers, and in veterinary circles in recent weeks, has been "What went wrong with the foot-and-mouth disease campaign in Mexico, and why was the no-vaccination policy reversed?" As stated in the *American Hereford Journal* (Dec. 15, 1947), "Collapse of the program, after some $35,000,000 had gone down the drain, came as something of a shock. No serious rumor had been forthcoming that all was not well. The American cattle industry, therefore, was surprised at the announcement of suspension of major parts of the slaughter program. They were given no opportunity of a hearing before the news was released." *The Western Dairy Journal* (Dec. 16, 1947) said editorially that "there should be an immediate Congressional investigation into the entire deal to date, with special reference to the career men in and out of the federal Bureau of Animal Industry."

We believe the criticisms are justified and are the result, largely, of the government's failure to present all the facts. It is now apparent that the USDA releases and monthly summaries of developments, upon which the JOURNAL editors and many other people relied for full and authentic information, fell considerably short of reporting actual conditions in Mexico. Granting the delicate diplomatic and political aspects of the situation, it would appear that this is a case of too many government agencies deciding what should be told about the foot-and-mouth disease campaign below our border. Add to this the too-frequent tendency of government information agencies to make things look as good as possible and one has the answer as to why a lot of people, who have a right to know all the facts, were not prepared for the about-face announced late in November.

As to the demand for "an immediate Congressional investigation," we would be for it if it would reveal the extent to which diplomatic, political, and other complications may have, perforce, delayed and hampered the hard-hitting and rapidly moving tactics which are essential to foot-and-mouth disease eradication by the slaughter method. If, on the other hand, the purpose of an investigation were only to find a possible scapegoat, then we would be against it. Congress and the country have already had the benefit of one investigation of the Mexican situation through the inspection trip made by a special committee of Congress last summer. Because of the current criticisms, it is interesting to review the observations and conclusions of that committee as reported by its chairman, Representative (Dr.) George W. Gillie in the symposium on foot-and-mouth disease before the AVMA convention last August. Briefly, the conclusions and recommendations were as follows:

1) The eradication program is lagging behind, instead of being ahead of the disease. Operations should be speeded up—at least doubled in scope and intensity.
2) The faster the campaign can be pushed, the less it will cost in the long run. Funds should be made available immediately for this speed-up.
3) There should be an executive director of the campaign, approved by both governments, with the ability to direct it with the speed, coördination, and efficiency essential to its success.
4) The present strategy of the campaign (to block northward progress of the disease, drive it back southward and eastward and finally eradicate it) is endorsed.
5) Everything possible should be done to find a market for the uninfected cattle in northern Mexico, including export markets for their meat.
6) Regardless of salvage operations and other expedients, the only way to wage the campaign successfully is to kill and bury all infected and exposed animals as rapidly as possible.

Commenting further, Congressman Gillie said, "The lines are drawn in this great battle. . . . The chips are down. The stakes are high. If our vast American livestock

industry—the very backbone of a strong farm economy—is to be preserved and advanced, we must wage this war to a successful conclusion, no matter what the cost."

This, certainly, was plain talk. Yet, the USDA "Summary of Developments" for Aug. 4, 1947, in reporting the inspection trip of the committee, merely commented that, "a seven-man delegation of the United States Congress expressed general approval of the plan of eradication and its execution although it urged greater speed and made other recommendations."

As to the merits or demerits of the "no-vaccination" policy originally adopted, we are in no position to judge. Regardless of results reported in Germany, Italy, other European countries, and in Argentina, the usefulness and efficiency of a vaccine in the Mexican outbreak must still be demonstrated. It certainly will not cure or eradicate the disease. If, in view of the "social and economic impact" of the slaughter campaign upon Mexico, vaccination can be made to accomplish significant results, then its use would certainly be an advantage.

In any case, plain talk and all the facts should be the order from now on. Foot-and-mouth disease is no respecter of diplomatic secrecy and formalities any more than it is of international borders. Anything less than the whole story is almost sure to have an embarrassing outcome, as it already has, and is downright dangerous in addition.

Curtailing Domestic Animals

While modern India is planning to regain its pristine glory by reviving the zoötechnics of ancient Asia, certain economists of the U.S.A. are charting a course toward fewer farm animals in the face of the enlarging human population — the straight course toward the very level that modern India is striving desperately to uplift. Lowering the ratio of man and animals just-like-that, even as a temporary expediency, is playing around with a question too vital for off-hand decision.

According to the Metropolitan Life Insurance Company, there were a million more babies born last year than would have come into the world had the birth rate of 1933 prevailed. Inasmuch as the problem of nourishing the inevitable annual increments, in keeping with the customary standards of milk- and meat-eating people, is an underlined principle of veterinary science, the first duty of the veterinary service is to teach the fact that arbitrarily shifting the ratio of domestic animals to human populations can have a far-reaching effect on the health and vigor of the greatest of nations.

The feed-saving programs scientifically mapped out by the animal husbandry departments of the experiment stations are most decidedly not based upon a future over-all reduction of domestic animals per capita but strictly upon *better feeding of better animals*, which is a bird of another plumage. In fact, as world history shows, *fewer animals means poorer animals*. At the Animal Nutrition Conference held in Columbus, Ohio, last fall, Prof. Damon Catron of Iowa State College warned against the reduction of farm animals below a reasonable level. With that, students of long-range economics will agree.

Allergy in Clinical Veterinary Medicine

He who defines allergy writes a book. And then, at best, leaves the student floundering in a vista of unknowns. Once upon a time, microbiology was over-filled with unripe theorems. If defined as "hypersensitivity to substances that are harmless in general," the phenomenon called allergy has yet to be distinguished from toxicity which is a different type of reaction. Between the two—allergic and toxic reactions—lies the study of allergy with its lack of clear-cut definition of, and distinction between, atopy, anaphylaxis, idiosyncrasy, immunity, resistance, etc., which authors use in both the same and opposite senses, at least, in some respects.

Allergy can no longer be dismissed with Lucretius' (1 B.C.) observation that "One man's meat is another man's poison." True as that is, the reason remains to be explained in terms that the clinician can understand and use. The clearest light shed on the subject is the new knowledge of histamine and its demonstrable antagonists.

The sole purpose of this brief is to draw attention to the growing importance of allergy in clinical medicine in the face of its baffling complexity. A long row of new words have been coined to fit the study and there are many types of allergy: innate,

acquired, passive, local, general, experimental, endogenous, exogenous, monovalent, polyvalent, and other forms of reactivity due to stimuli plus obscure predisposing factors. In short, allergy is an involved process.

In man, the allergic state may last from a few weeks to a lifetime, and it may be caused by inconceivably tiny doses of the exciting agent. A changed conception to be taken into account in clinical work is that allergization can be induced not only by proteins but also by lipoids, carbohydrates, and inorganic chemicals. In the over-all picture, clinically expressed allergy in veterinary practice is a study so vague and so obviously significant that following its development to keep abreast of the times is in order. The book entitled "Allergy", by Erich Urach and Philip M. Gottlieb (Green and Stratton, New York, 1943), would be a good start for the study of the complex phenomena. To be regretted is that the subject is rarely touched upon in current veterinary literature in this country.

Accreditation Status of Foreign Veterinary Colleges

Since World War II, state boards of veterinary examiners are facing more frequently than before the question of accepting credentials from foreign veterinary colleges. The question is presented by two groups: (1) foreign born veterinarians who have immigrated to the United States and who desire to qualify for professional work of one kind or another, and (2) prospective veterinary students residing in the United States who are thinking of enrolling in some foreign school because of inability to gain admission to an accredited college in this country. While the number of such foreign educated applicants for state board examinations is not large, and probably will not be, their cases constitute a problem for the licensing agencies, the solution of which is, naturally, of vital concern to the individuals themselves.

Frequently, the state boards are referring these matters to the Council on Education or to the AVMA office. Most of the states have veterinary practice acts which specify the credentials which applicants must present in order to qualify for licensing examinations; in about two-thirds of them, one requirement is graduation from a "recognized" veterinary college, which is generally interpreted to mean a college approved or recognized by the AVMA. Hence, it seems desirable to clarify what constitutes AVMA approval of a veterinary school and where it applies.

First, the present Council on Education and its predecessor, the Committee on Education, and the old Committee on Intelligence and Education, has formally or officially accredited only veterinary colleges in the United States and Canada which have met the minimum standards adopted by the Association. Currently, these standards are defined in "Essentials of An Acceptable Veterinary School."

Second, only those schools are formally accredited which have been or can be inspected at appropriate intervals by the Council. To date, there has been no reason for extending, or presuming to extend the present limits of this inspection work.

Third, the schools recommended for approval each year appear in the annual published report of the Council on Education; they presently comprise ten schools in the United States and two in Canada.

As stated previously, most of the state veterinary practice acts, require, among other things, that applicants shall be graduates of "recognized" veterinary colleges. In these states, it appears that this term is not clearly defined but is usually interpreted to mean recognition or approval by the AVMA and its Council on Education. In several states, the laws specifically refer to AVMA accreditation, while in several others the approval specified is by the federal Bureau of Animal Industry, the U. S. Army Veterinary Corps, the AVMA, or a combination of these agencies. In three states, graduation from a veterinary college accepted or approved by the state department of education is specified, while seven states require no graduate credentials, although, in practice, only graduates can take examinations for regular licenses.

Another factor affecting the eligibility of

foreign born and educated veterinary graduates to take board examinations is the citizenship requirement; this applies in 18 states and means that applicants must be citizens or at least have their first papers. Citizenship is also a requirement for civil service appointments with federal agencies employing veterinarians and in some states for similar positions.

Because of the rather frequent inquiries about the status of foreign veterinary colleges, the Council on Education appointed a subcommittee in 1946 to compile as up-to-date information as possible about them. The subcommittee (Col. S. C. Dildine and Dr. W. A. Hagan) completed its survey last year and the results were issued in mimeographed form to boards of veterinary examiners and to certain other persons or agencies having official need for the information. The reports on many foreign veterinary schools were unavoidably fragmentary but it is intended to revise the report from time to time as new information is obtained. In any case, the data will undoubtedly be useful to some of the state boards who face the question of foreign educated applicants.

The point of this discussion is that, in some instances, foreign veterinary graduates are denied permission to take veterinary board examinations because their colleges are not "recognized" or approved by the AVMA, when, as a matter of fact, a number of these boards have authority under their practice laws to exercise their own discretion in accepting or rejecting diplomas and other credentials from any veterinary college. Over the years, graduates of several foreign schools have come to this country and have qualified for licenses in various states indicating that, in the past, these state boards did exercise the discretion referred to.

It is suggested that a fair basis for decisions in the current cases, where the practice laws permit, would be proof that the preveterinary training and professional curriculum in a given foreign veterinary college are comparable to the requirements of accredited colleges in the United States and Canada. If acceptable evidence were submitted, the applicant's other qualifications for a license could then be determined by examination. In this way, reasonable consideration could be accorded to the individual who has come to this country with the intention of becoming a citizen and the hope of making a livelihood in his chosen profession.

"Cheese in Its Relation to Public Health"

This title headlined an article in the August, 1947, issue of the *American Journal of Public Health* and again in an editorial in the November, 1947, issue of the *Journal of the American Medical Association*. In both instances, cheese was brought squarely into the field of food inspection, a profession of as many facets as there are states and cities in the United States. Whose fault is it that there were 59 epidemics, 2,904 cases of illness, and 117 deaths traced to the eating of cheese since 1883? Food poisonings and typhoid fever accounted for most of the trouble. Included is the 1946 outbreak of typhoid fever in Ontario, which was traced to a typhoid carrier on one of the farms furnishing milk to a cheese factory. Involved were Salmonella, Staphylococcus, Brucella, and *Clostridium botulinus*, the use of raw milk in cheese making, and the marketing of unripened cheese. Pasteurization and increasing the holding time to no less than 120 days removes most of the danger, provided the milk comes from healthy cows and is handled in a sanitary manner. Cheese is not a great public health hazard but is a good example, among many, of the need of a food-inspection system at work from the stable to the pantry.

Health Conditions in Continental Europe.—An editorial in the *Journal of the American Medical Association* describes the health conditions of Europe as bad, particularly in Austria, Rumania, Poland, and Hungary. Malaria, syphilis, tuberculosis, and pellagra, aggravated by insanitary conditions, overcrowded dwellings, and substandard nourishment are given as the causes. The source of the information is the International Committee of the Red Cross. Some progress has been made to improve health conditions in Belgium and Czechoslovakia.

The human heart pumps 10,000 qt. of blood every twenty-four hours, although the total volume of blood is but 6 qt.

CURRENT LITERATURE

ABSTRACTS

Equine Encephalomyelitis Vaccine

Formolized chicken-embryo vaccine was administered intradermally in two doses to 3,026 horses in the Leningrad district. One died. Of 449 horses vaccinated with a single dose, 2 died. Of 2,583 controls on the same farms, 15 died.

Immunity to 10 m.l.d.'s of virus intracerebrally was obtained in rabbits vaccinated by subarachnoid injection of formolized chicken-embryo vaccine. The same immunity was attained by subcutaneous vaccination followed by disruption of the hemato-encephalic barrier. Simple subcutaneous vaccination produced no immunity.—[*G. F. Pogonyailo: Equine Encephalomeylitis Vaccine. Abstr. in Veterinariya, 24, (May, 1947): 10.*]—R.E.H.

Prophylaxis and Therapy of Equine Encephalomyelitis

The author refers to the Russian type of equine encephalomyelitis as Borna disease. In virus neutralization experiments involving 30 immunized rabbits, it was found that the spinal fluid had a higher virucidal titer than the serum. When the immunity was challenged with subarachnoid injections of virus, the rabbits which had received subarachnoid vaccination were more resistant (5 m.l.d.'s) than rabbits which had been vaccinated intravenously or subcutaneously (2 m.l.d.'s or less).

Two horses and 1 colt received subarachnoid injections of 20 cc. of hog-cholera serum by suboccipital puncture. Twenty-four hours later, they were inoculated with encephalomyelitis virus intracerebrally. The 2 horses survived without clinical reaction. The colt died with symptoms of encephalomyelitis. Three rabbit controls died.

In a natural outbreak, 8 diseased horses were given subarachnoid injections of 20 cc. of nonspecific serum. Six survived.

A 10 per cent solution of methenamine, 150 to 200 cc. intravenously or subcutaneously, was used in 23 horses showing early symptoms. Twenty survived. Of 6 horses treated by subarachnoid injection of methenamine, 20 cc. in the morning and 10 cc. in the evening, all survived.

It was concluded, from a review of the Russian literature and from the author's experience, that the best results were obtained when serum (specific or nonspecific) or methenamine were introduced into the subarachnoid space. When these agents were injected into the blood stream, they did not reach the cells of the central nervous system unless the hemato-encephalic barrier was disturbed by concomitant venesection or administration of hypotonic chloride solutions, or alcohol.—[*V. I. Yakushev, All-Union Inst. Exptl. Vet. Med., Moscow: Therapy and Prophylaxis of Equine Encephalomyelitis. Veterinariya, 24, (May, 1947): 4.*]—R.E.H.

Equine Leptospirosis

From 1940 to 1946, the authors observed 111 natural cases of equine leptospirosis with 66 per cent mortality. The disease occurred in conjunction with outbreaks of leptospirosis among cattle and silver foxes on the same farms. Bacteriologic examination of 28 clinical cases in horses resulted in the isolation, from the blood, of two pure cultures of Leptospira. Of 3 foxes fed parenchymatous organs from horses dead of the disease, 1 died with symptoms and lesions of leptospirosis. The other 2 showed no symptoms but showed agglutination titers of 1:10,000 to 1:16,000.

Two fillies and a colt, 3 to 6 months of age, inoculated intravenously with Leptospira cultures, contracted the disease. The organism was recovered in each case.

The strains of Leptospira isolated from horses were morphologically, culturally, and serologically identical with strains previously obtained from the silver fox, Arctic fox, and cattle.—[*S. Y. Lubashenko and L. S. Novikova, Cent. Res. Lab. for Fur Prod., USSR: Leptospirosis in Horses. Veterinariya, 24, (May, 1947): 11.*]—R.E.H.

Evacuation of the Stomach in Acute Gastrectasis

The manipulation of the stomach tube frequently causes cardiospasm in horses. This can be dealt with by careful maneuvering of the tube or infusion of some olive oil or 250 to 500 cc. of hot water (50 C.). The Schuetzler method recommends the introduction of a 10-cm. tube into one nostril for the entrance of the fluid and a 15-cm. tube into the second nostril for the evacuation of the gastric contents. At times a small pump must be attached to the narrower tube. Intramuscular injection of 5 cc. of synthonephrin (synthetic adrenalin?) appeared to be helpful in controlling epistaxis which formerly occurred following

the use of the nasal route. This can also be prevented by the use of the oral route for which the author recommends a two-barreled tube (5 cm. and 15 cm. combined in one tube), a description of which is given with two illustrations.—[*Jan. Budzynski: Technika usuwania tresci przy ostrym przeladowaniu zoladka. (The Technique of Evacuation of the Stomach in Acute Gastrectasis Due to Food.) Medycyna Weterynaryjna, 3, (March, 1947): 168-170.*]—L.I.H.

Brucella Abortus Variants

Independent variation of colony morphology and antigenic behavior in *Brucella abortus* variants has been demonstrated with the help of an acriflavine test, the results of which parallel the *in vivo* antigenic activity. A description of a number of variants exhibiting various combinations of colony morphology and antigenic behavior, as revealed by the acriflavine test, is presented. The bearing of these observations on the interpretation of dissociation in terms of spontaneous appearance (mutation) of variants and their establishment under selection pressure is discussed. It is pointed out that, in the presence of independent morphologic and other changes, morphologic observations alone cannot be relied upon for correct classification of variants.—[*Werner Braun and A. E. Bonestell: Independent Variations of Characteristics in Brucella Abortus Variants and Their Detection. Am. J. Vet. Res., 8, (Oct., 1947): 386-390.*]

Salmonellosis Abortion Among Horses

Since 1935, there has occurred in the Northeast District and Hokkaido (the north island of Japan) an epizoötic which attacked a number of young horses. The paramount symptoms of the disease were the high temperature and its remarkable diurnal variation, peculiar nuance (the color of dirty brick or boiled meat) of conjunctiva, localized swelling, abscess, and lameness.

The author has fully ascertained that this disease is due to *Salmonella abortivoequina* and presents laboratory diagnostic aids to substantiate his work. He prefers to call this malady the "Natural Cases of Salmonellosis Abortion."

It was pointed out that there were many cases associated with mixed infections, particularly infectious anemia. Other bacteria such as *Streptococcus haemolyticus, Shigella equirulis*, and the colon group also act as contributory agents.

The administration of antiabortion serum seems to be effective for the treatment of acute cases of the disease, and vaccine therapy also brings encouraging results in chronic cases.

Among animals showing complicated recurrent fevers, there are frequently found cases of mixed salmonellosis infection and infectious anemia. In such cases, if the treatment with abortion serum was carried out, the symptoms of the infectious anemia became unmasked as those of the abortion salmonellosis faded. Accordingly, the complication of these two diseases were easily confirmed.—[*K. Fukano: Studies on Salmonella Abortion among Horses. Jap. J. Vet. Sci., 2, (1940): 516.*]—K.F.B.

Uterine Prolapse in a Mare

Because of a difficult presentation in a mare, the amniotic sac was punctured and a manual extraction of the fetus performed. The labor pains brought about a prolapse of the uterus. The mare rolled on the floor and soiled the prolapsed uterus. The placenta was detached and the uterus cleaned, disinfected, and then replaced. In spite of medication consisting of prontosil, thoromangan, 1 : 1,000 $HgCl_2$ intravenously, and 20 per cent camphor subcutaneously, an infection did develop. The uterus was irrigated with 4 liters of a 1 : 1,000 trypaflavine solution. This treatment was given credit for the improvement which began on the thirteenth day.—[*Jan Grudziecki: Przypadek wypadniecia macicy u klaczy przy porodzie. (A Case of Uterine Prolapse during Labor in a Mare.) Medycyna Weterynaryjna, 3, (May, 1947): 325-326.*]—L.I.H.

The Genus Corynebacterium

The author investigated the various characteristics of the genus Corynebacterium, employing many strains of *C. diphtheriae, C. pseudodiphthericum, C. renalis, C. equi, C. pseudotuberculosis muris, C. acne contagiosae, C. pyogenes*, and *C. pseudopyogenes*. He classified these organisms into six species, namely *C. diphtheriae, C. pseudodiphthericum* (type I, type II), *C. xerosis, C. acne, C. pyogenes*, and *C. pseudopyogenes* (type I, type II).

In the examinations, it was found that those organisms hitherto described as *C. renalis, C. equi*, and *C. pseudotuberculosis muris* are all the same and identical with *C. pseudodiphthericum*, though they have somewhat different characteristics, depending upon the strains.—[*Y. Ochi and K. Zaizen: Studies on the Genus Corynebacterium. Jap. J. Vet. Sci., 2, (1940): 182.*]—K.F.B.

Hemoglobin Concentrations in Turkeys

Hemoglobin was determined by the Sheard-Sanford "oxyhemoglobin" method in the blood of Standardbred Bronze, Broad Breasted Bronze, and cross between these two varieties of turkeys. Blood from both males and females between the ages of 21 and 28 weeks was analyzed. Hemoglobin concentration in the normal controls varied between 13 and 15 Gm. per 100 cc. No sex difference could be established. Oral administration of approximately 900 mg. of the

dimethyl ether of diethyl stilbestrol (Dianisyl hexene) over a period of one month reduced the hemoglobin concentration approximately one-fourth. Subcutaneous injections of 56 mg. per kilogram of body wt. of a suspension of diethyl stilbestrol into the throat wattle in two successive weeks produced about the same degree of anemia. However, only a very mild anemia was produced by a single injection of 41 mg. (females) and 61 mg. (males) of diethyl stilbestrol. The maximal effect of the estrogen was not noted until three weeks after injection.—[*L. F. Wolterink, E. P. Reineke, and J. A. Davidson: Hemoglobin Concentrations in the Blood of Normal and Estrogen-Treated Turkeys. Am. J. Vet. Res., 8, (Oct., 1947): 431-436.*]

Gases from Spontaneous and Rumen Fermentation of Feedstuffs

Gases from certain spontaneously fermented feedstuffs differ in relative amounts from rumen gases produced when the same feedstuffs are fed. The major differences are that methane is not produced *in vitro* but is in the rumen; and hydrogen, while high in higher protein feeds *in vitro*, is very low or may be absent in rumen gas.—[*R. E. Nichols: A Note on the Comparison of Gases from Spontaneous and Rumen Fermentation of Certain Feedstuffs. Am. J. Vet. Res., 8, (Oct., 1947): 391-395.*]

Intramammary Infusion of Penicillin in Streptococcic Mastitis

Bovine quarters infected with streptococci were treated by an intramammary infusion with penicillin. A suspension in peanut oil, an emulsion of 10 per cent water in mineral oil or as a solution in water were used to treat a total of 316 quarters. The mineral oil emulsion was more efficacious than the aqueous solution in elimination of the streptococcic infection. The peanut oil suspension was probably inferior to the aqueous solution. The efficacy of treatment was not influenced by the degree of inflammation initially present in the affected quarters.—[*G. R. Spencer, Mary E. Kraft, and G. K. L. Underbjerg: Efficacy of Intramammary Infusion with Penicillin and Diluents on Streptococcic Mastitis. Am. J. Vet. Res., 8, (Oct. 1947): 325-329.*]

Recovery of Mastitis Streptococci from the External Surface of the Teat

After cleansing and disinfecting the teat, and by the use of special inhibitor agar, *Streptococcus agalactiae* was recovered nine times and *Streptococcus dysgalactiae* once in 28 attempts to recover the organisms from the external teat surface in infected quarters. In all cases, a minimum interval of eight hours had elapsed from the time of milking. The organisms were recovered as late as the fifth day following the last milking. In no case were the organisms recovered from the outer surface of teats of cows that were not shedding these in their milk. The procedure of cleansing the udder and teats, although more thorough than commonly recommended in the usual preventive measures for the control of mastitis, did not in all instances destroy these organisms on the external surface. The recovering of *Str. agalactiae* on the external surface of the teat eight hours to five days after milking, even with the careful procedures used, indicates that this organism may become established deep in the wrinkles of the teat skin and remain there for several days. These findings suggest the need for further work to determine what part this may play in a mastitis control program.—[*W. L. Ingalls and E. P. Johnson: The Recovery of Streptococci Associated with Bovine Mastitis from the External Surface of the Teat. Am. J. Vet. Res., 8, (Oct., 1947):321-324.*]

Sulfamerazine in Avian Lymphomatosis

Sulfamerazine was fed continuously to a group of White Leghorn chickens from hatching to 300 days of age. The drug was added to the diet at the rate of 1.0 per cent for the first five weeks and 0.5 per cent thereafter. The level of sulfamerazine was lowered because symptoms of toxicity were observed at the 1.0 per cent level. Sulfamerazine appeared to have no influence upon the incidence of avian lymphomatosis. The incidence was 16.2 per cent among the 37 females fed sulfamerazine and 15.2 per cent among the 46 female controls. Both neural and visceral lymphomatosis was found. The diagnoses were based on gross necropsy findings.—[*T. C. Belding and G. D. Dibble: The influence of Sulfamerazine upon the Incidence of Avian Lymphomatosis. Am. J. Vet. Res., 8, (Oct., 1947): 413-415.*]

Fowl Pest (Pneumoencephalitis) Infection in a Cat

A cat, kept in the laboratory for controlling rats, developed severe nervous symptoms and died from an acute ailment on the third day. Histologic studies showed severe nonsuppurative meningoencephalomyelitis. Experimental transfers of the causative agent were continued in fowl and eggs. The agent isolated from the cat was specifically neutralized by fowl pest antiserum.

The authors believe that this animal died of a natural infection caused by fowl pest virus.

Additional attempts to infect normal cats with fowl pest virus *per os* were apparently successful, the animals showing a comparatively marked susceptibility to the virus.—[*J. Nakamura and T. Iwasa: Fowl Pest Infection in a Cat (Pneumoencephalitis). Jap. J. Vet. Sci., 4, (1942): 522.*]—K.F.B.

The Relationship between Mallein Reaction and the Morphologic Changes in the Lungs of Mongolian Range Horses

The author endeavored to observe the subject from various aspects, especially the close relation between the allergic reaction and postmortem appearance together with the pathologic features in the case of allergy. In the early stage of pathologic changes, a hemorrhagic condition was often observed in the lung in isolated spots representing 20 per cent of lung tissue. In a few cases, there were zones of inflammation surrounding the nodules observed.

One hundred and eighty-one cases (60%) of glandered horses presented edema of the lung. Bronchopneumonia was seen in 132 cases (40%) which generally presented nodules, although there were 14 cases of simple glanderous bronchopneumonia.

Nodules were found in slightly greater numbers in the right lung as compared with the left and were more prominent along the superior border. When the nodules were large in number, the manifestation of allergic reaction was low or negative. In those cases in which the reaction was negative, postmortem examination showed the greatest number of pathologic cavities. Considering the relationship between mallein reaction and occurrence of hepatization, where mallein reaction was suspicious or negative, the occurrence of hepatization was most frequent.—[*O. Ichikawa: The Relationship between Mallein Reaction and the Morphological Changes in 300 Cases of Glanderous Lungs of Mongolian Range Horses. Jap. J. Vet. Sci., 2, (1940): 228.*]—K.F.B.

Hemolytic Streptococci in the Vaginas of Pregnant and Nonpregnant Mares Inoculated with Salmonella Abortivoequina

Following observations of Hirato and his collaborators, the author traced the presence of hemolytic streptococci in the vagina of 17 pregnant (10 aborting and 7 resistant cases) and 5 nonpregnant mares inoculated with *Salmonella abortivoequina*, as well as 12 normally delivered and 87 normal early pregnant mares (some as early as one month after conception).

The various biological characteristics of the 130 strains of hemolytic streptococci isolated from these animals were then examined.

Results indicated that the appearance rate of hemolytic streptococci of type A [according to Watanabe's phenomenon trehalose nonfermenting and fermentor of both sorbitol and lactose) in the vagina is the highest in cases inoculated with *S. abortivoequina*, next in the normally delivered cases, and the lowest in the normal pregnant mares.—[*T. Nishi and Y. Shibuya: Studies on Hemolytic Streptococci Appearing in the Vaginas of Pregnant and Nonpregnant Mares Inoculated with Salmonella Abortivoequina. Jap. J. Vet. Sci., 2, (1940): 37.*]—K.F.B.

Effects of Penicillin on Brucella Suis in Vitro and in Vivo

The inhibitory effect of penicillin was tested on 17 strains of *Brucella suis* and on strains of *Brucella abortus, in vitro* and *in vivo*. With massive inoculation, *Br. suis* was inhibited markedly at a concentration of 6.25 Oxford units of penicillin per cubic centimeter of tryptose agar medium. When smaller inoculations were made to study quantitatively the inhibitory effect, complete inhibition occurred in eight strains of *Br. suis* and one strain of *Br. abortus*, while at least 45 per cent inhibition was noted in seven of the remaining eight strains in this trial. The remaining strain was inhibited only about 20 per cent. Strain differences in sensitivity were apparent. Studies were conducted using a total of 180 guinea pigs to determine whether the administration of penicillin would be effective in combating brucellosis in this species. Such treatment was not effective in altering the course of the disease in these studies, regardless of the exposure dose of *Br. suis*, the amount of penicillin administered (800 to 3,200 Oxford units of penicillin per day for a period of five days), or the time during the course of the disease at which treatment was initiated. Death occurred in 36 per cent of the guinea pigs treated with penicillin, apparently due to a toxic reaction to the penicillin.—[*Doris E. Bunnell, L. M. Hutchings, and C. R. Donham: Effects of Penicillin on Brucella Suis in Vitro and in Vivo. Am. J. Vet. Res., 8, (Oct. 1947): 367-373.*]

Spirocerca Sanguinolenta in a Blue Fox

A blue fox was presented for necropsy, having died after an eight-day period of poor appetite. An aneurysm of the aorta was found at its entrance through the diaphragm. The enlargement measured 2.5 cm. in its long axis and 1.5 cm. wide. Adjacent to the aneurysm and in the pulmonary ligament on the right side, there was a firm nodule about 1.5 cm. in diameter. This was found to contain two red, spiraled roundworms (3.2 and 5.0 cm. long) which were identified as a male and a female *Spirocerca sanguinolenta*. The parasite has not previously been reported in Norway or the other northern countries. The aneurysm probably resulted from damage to the mediums as the parasites migrated from the stomach through the wall of the arteries into the wall of the aorta.—[*R. Svenkerud: Spirocerca Sanguinolenta in a Blue Fox. Norsk Vet.-tidsskr., 59, (July, 1947): 193-201.*]—A.G.K.

BOOKS

United States Dispensatory, Twenty-fourth Edition

Holding out the voluminous, 115-year-old United States Dispensatory as the most majestic work of all time in the field of medicinals is neither panegyric nor exaggeration. As a reference book for every branch of medicine, it has no peer. It is the kind of book one is proud to possess. Moreover, for the veterinary profession, the twenty-fourth edition is a landmark in American veterinary history. One of its four associate editors is David K. Detweiler, assistant professor of pharmacology, School of Veterinary Medicine, University of Pennsylvania, who writes 60 pages of up-to-the-minute material on the drugs and biological products now employed in clinical veterinary medicine. The departure has the stature of a plaque erected to the memory of Benjamin Rush, James Mease, Joshua B. Lippincott, Rush Shippen Huidekoper, and John Marshall who preconized and inculcated the spirit of close coöperation between human and animal medicine for the common good of all humanity. At the risk of seeming grandiose, the wide backbone of this book in red trimmings sparkles like a gem on the shelves of a veterinarian's library and classifies him as a professional man of the upper cadre. Useful? Well, to this reviewer, one works to considerable disadvantage without it. The current edition is particularly striking because of describing (1) the many new drugs and biological products recently discovered and put to work, (2) the worthwhile nonofficial remedies which have come into general use, (3) the antibiotic and antihistaminic agents, (4) the indispensable tests and processes, (5) the veterinary uses and doses of drugs, (6) the tables of the U. S. Pharmacopoeia and National Formulary (atomic and molecular weights, alcoholometric, thermometric, weights and measures and their equivalents, *et al.*), and (7) the fact-finding index.

The pages devoted to the official drugs have been *the* classic too long to need a reviewing here. Suffice to say that the name, the abbreviations, the history, the source, the physical and botanical and chemical properties, the manufacturing process, the tests, the stability, the assay, the toxicology, the uses, and the doses of medicinal agents make up an assemblage of easy-to-find information that seldom disappoints the most critical searcher. What more could be said?

The dignity of possessing at least this edition of the U.S.D. should be an outstanding ambition of every veterinarian.—[*United States Dispensatory, Twenty-Fourth Edition. By Arthur Osol, Ph.G., M.S., Ph.D., George Farrar, Jr., M.D., F.A.C.P., and four associates. Advisory editor, Horatio C. Wood, Jr., M.D., Ph.M. 928 pages. 6 in. by 10 in. Heavy binding. J. B. Lippincott Company, Philadelphia, Montreal, London. 1947. Price, $16.50.*]

Poultry Handbook

The subtitle of this book is "An Encyclopedia for Good Management of All Poultry Breeds." It is a compilation of information gained exclusively from recent publications of outstanding poultry experts of whom nearly 100 are listed in the forepart of the book as "authors," meaning authors whose published articles are cited in the book which is edited by Rudolph Seiden, chief chemist, Haver-Glover Laboratories, veterinary supply house of Kansas City. Among the veterinary pathologists whose names appear in the author list are F. E. Allen and E. F. Waller, University of New Hampshire; J. R. Beach and W. R. Hinshaw, University of California; W. A. Billings, University of Minnesota; E. M. Dickinson, Oregon State College; L. P. Doyle, Purdue University; A. J. Durant, H. C. McDougle, and A. W. Uren, University of Missouri; M. W. Emmel, University of Florida; Robert Graham, University of Illinois; E. P. Johnson, Virginia Polytechnic Institute; E. L. Jungherr, Storrs Agricultural Experiment Station; and D. E. Madsen, formerly of Utah Agricultural Experiment Station. The work of these and of many poultry husbandrymen and others has been used by the editor in compiling material for the encyclopedia.

Contrary to the usual pattern, the book opens, instead of closes, with its bibliography of 98 references. The object is frankly told in the editor's preface as follows:

> The main purpose of this book is to help the poultry raiser improve the health of his flocks and thereby increase his income. . . Care is taken to define all scientific terms to make them clear and understandable. In addition, words that might be mispronounced have been divided into simple syllables.

Clinical veterinary medicine is not completely deserted. The poultryman is advised "not to overlook the assistance of the local veterinarian who specializes in the diagnosis and treatment of poultry ills," nor to avoid the experts of the nearest Agricultural Experiment Station and the Extension Services. The assistance received from (1) adminstrative officers in the service of the federal and state governments, (2) the colleges and universities, and (3) the commissions of the U. S. Pharmacopoeia XIII and of the National Formulary VIII is acknowledged. This aid, together with that of the authors named, ought to assure the highest degree of contemporary scientific perfection.

The editor takes the blame for errors that

may have crept into the text. To be faithful to his obligation to the veterinary profession, a reviewer, therefore, has to point out that the outbreak of fowl pest in New Jersey in 1925 and the pneumoencephalitis discovered in California in 1942 were not identical nor caused by the same virus as the author of the article on Newcastle disease has stated. It also seems apropos to regret that the poultry industry is not advised about the nation-wide expansion of poultry eviscerating plants. These and the large force of veterinary inspectors working in them under federal regulations may be disappointed at not being mentioned in an otherwise excellent treatment of classifying, marketing, and dressing poultry.

In combing through the material and observing the technical ground covered, there is no doubt that the poultryman will be pleased with the working insight into the cause, symptoms, prevention, and treatment of the common poultry diseases such as the poultry pathologists would approve as a part of veterinary literature.—[*Poultry Handbook. Edited by Rudolph Seiden, Ch.E., Chief Chemist, Haver-Glover Laboratories. 410 pages. Illustrated. D. Van Nostrand Company, New York, N. Y. 1947. Price, $6.00.*]

Annual Review of Microbiology

This "year book" is related in kind and purpose to *Annual Review of Physiology* and *Annual Review of Biochemistry*. Like the other two, it is a résumé that intentionally takes the reader into the upper echelons of the specialist (to quote from the preface) "leaving the quiescent areas to be summarized as developments demand." The 16 topics chosen for the 1947 review of microbiology are presented by that many senior authors and 5 junior authors. The material is selected and edited by an editorial committee of 6 members headed by Charles E. Clifton, editor, Stanford University; Sidney Raffel, associate editor, Stanford University; and H. Albert Barker, associate editor, University of California. The subjects covered are:

Morphology and Cytology of Protozoa
Antigenic Variation in Protozoa and Bacteria
Life Cycle of Malarial Parasites
Variation in Phytopathogenic Fungi
Variations in Phytopathogenic Viruses
Some Aspects of the Problem of Growth Factors for Protozoa
Bacterial Metabolism
Industrial Fermentations
Quaternary Ammonium Compounds
Antibiotics
Chemotherapeutic Agents
Immunochemistry
Some Aspects of Active Immunization
Medical and Epidemiological Aspects of Enteric Infections
The Rickettsiae
Respiratory Viruses

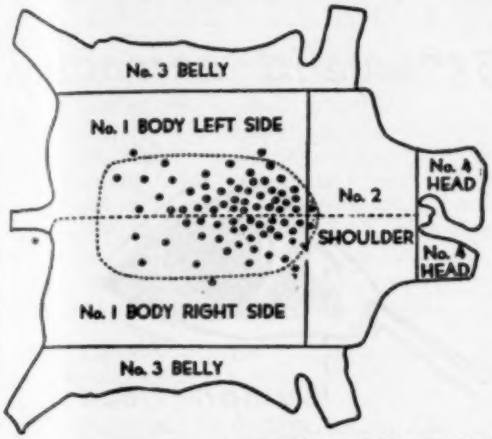
Inasmuch as the subjects chosen as well as the scientfic record of their *status quo* are the word of hand-picked scholars and workers and the *literae scriptae* stands without blemish, the most capable reviewer is caught flailing material already expertly winnowed by the group of critical authors selected to cover the ground. As the 9 writers of the preface declare, the *Review* is intended to be a critical appraisal, rather than a mere compilation, of the literature. On that account, although not a medical primer, the book gives a clear and fascinating insight into the incessant researches that keep lifting the practice of medicine to higher scientific levels, and concurrently uplift the confidence of the discriminating clinicians whose fondest hope is to set aside the mantle of empiricism. If knowledge of what's cooking in the cauldrons of medical research is of no concern to the clinician, he nevertheless hungers for the output and is always thankful not only for the new weapons put into his hands but also for the advancement of medical science that led to their discovery. Another way to say it is that, after all, the medical practitioner is first a clinical pathologist who pins his faith in the past, present, and future studies of his superiors.

By all means, add this book to your technical library and spend an hour from time to time digging into its contents. Just now it would be a good idea to digest the chapter on the quaternary ammonium compounds which are writing some new pages of history in the field of dairying. The work explains why these compounds excel.—[*Annual Review of Microbiology, Vol. I. Edited by Charles E. Clifton, Sidney Raffel, and H. Albert Barker. 404 pages. Cloth. Annual Reviews, Inc., Stanford, California. 1947. Price, $6.00.*]

Report—National Livestock Loss Prevention Board
(Southwestern Region)

For the alarming truth about preventable livestock losses, one follows the comprehensive reports of a voluntary salvage unit—the NLLPB operating out of large livestock centers like Chicago, Kansas City, and Omaha whence its work and its educational programs radiate to everybody who raises or handles farm animals often without realizing their responsibility to human and animal welfare. In the matter of preventing losses of the world's food tonnage and in planning and operating permanent programs for reforming production and conservation practices on a large scale, this national organization has become not only the sole companion of applied veterinary science but also the most far-reaching confederate of the humane societies. Salvaging calculable tons

of food needed by an undernourished world and with the same token abolishing wholesale suffering among domestic animals is indeed something for the books. Moreover, in having set up machinery for displaying facts in authenticated figures that speak for themselves, this voluntary organization has taken a definite



—*Courtesy of Ray L. Cuff.*
Illustrating how warbles damage the most valuable part of a cattle hide.

lead over the veterinary service which up to the present time has had to string along with questionable estimates. Veterinary literature in its usual emotionless reactions lacks preferred articles on the tremendous undertakings of this salvage unit. The present livestock loss prevention board did not march in "with banners flying high" but grew slowly to maturity amid scattered information gathered from the claim agents of railroads and the bookkeepers of packing houses and stockyards where wanton sacrifice of valuable property was shown to reach the astonishing figures these reports contain. Always, in reading these revealing reports, the mind turns to W. J. Embree and veterinary staff of the former Western Weighing and Inspection Bureau from which the NLLPB sprouted (*see, Veterinary Military History*, Vol. II: 963-970). But, the scope of the Board's task did not stop with the careless practices of the railroads and stockyards. It went to the grass roots to institute reforms in (1) the control of flies around and in farm buildings, (2) the organization of campaigns against cattle grubs and lice, (3) the ridding of lice and mites in poultry houses, and (4) the handling of the parasite problems in sheep and swine. In these connections, the Board's field trials have attracted world-wide attention, and concurrently brought veterinary practices to a higher plane in the public mind.

The report in hand refers only to the "Southwestern Region," but the figures and the control programs related apply equally well to all parts of the world where the people suffer the consequences of raising and handling domestic animals in disobedience to modern knowledge and facilities. The bold attack on the warble fly in the face of the leather shortage is one among other examples of the Board's audacious demonstrations.—[*National Livestock Loss Prevention Board—Southwestern Region—Annual Report for the year ending Dec. 31, 1946. Edited by Ray L. Cuff, Regional Manager, Kansas City, Mo. Illustrated Booklet. Linotype and offset printing. 1947.*]

Cradle of the Trotter—Goshen

Regulating the weather and relegating the horse to oblivion are constants of the same type, the one as futile as the other. Glib headlines would wipe the domestic solipeds from the face of the earth with great regularity but for sober books that expunge the idea that the civilized plantigrades are sinking to the level of the primitive tribes.

"Cradle of the Trotter" is that kind of a book, not because the light harness horse is regaining its pristine glory, or that the Goshen race track has become a household word like Churchill Downs, and not even because Orange County, New York, was the birthplace of fleet horses and horse racing back in colonial days, but because the book, packed with thrilling American history, portrays the innermost life of a famous community in respect to its foremost delectation—the speedy horse of saddle and harness.

The fact that a relatively small New York town is the adopted home of a celebrated classic—the Hambletonian Stakes—is not an accident. It is the climax not only of two hundred years of outstanding devotion to horses of speed and pleasure but also of the economics and amenities of the famous county—the one-time playground of the Harriman's, the Lorillard's, the Goelet's, the Vanderbilt's, and many others who brought great social events and prominent men to Goshen, the "capital of the harness horse." It all started in 1712 when Sarah Wells with Indian escorts, 2 white men, 2 horses, and 2 cows settled on the spot that was to become Goshen. From here on, Orange County differed from other pioneer settlements in the U.S.A. Its yeomanry established a character of its own with fleet horses as the dominant obsession. Messenger, whose blood flows in every trotter down to this day, was brought to Goshen for the breeding season of 1801. The great Rysdyk's Hambletonian was born near there in 1849 and, with nothing more to his credit than passing Messenger's blood to descendants, earned $100,000 in stud fees for Old Bill Rysdyk and gave the U.S.A. a light harness horse industry, the topmost distraction

until individual transportation was refashioned by automobiles.

In veterinary medicine, Goshen is best known as the home and workshop of the late John F. Devine, a distinguished clinician, who built a large practice and classical hospital to harmonize with the princely environment. His name lives on in the upper bracket of the commercial field. Johnny Devine, trick rider of the hunt club, on one occasion described in the book "gave an exhibition of fancy mule riding with hanging stirrups."

The book is not a drab compilation of statistics and pedigrees the title might imply. It is the story of Goshen and Orange County, their folk, great breeders and trotters, notable events, and the part these played in the life of the community. The author is Elizabeth Sharts, official historian of Goshen, whose mother, Kate Sharts (1864-1939), was the hostess of famous trainers, owners, and glamor boys whom Goshen attracted through the many years of trotting horse history. Bud Doble, George Starr, Pop Geers, John Splan, Robert Bonner, Pierre Lorillard, C. K. G. Billings, Governor Earle, Robert Goelet, General Grant, Dick McMahon, Leland Stanford, August Belmont, W. C. Whitney, Alfred Vanderbilt, and outstanding horses from Messenger to Titan Hanover are just a few of the names that figure in the fascinating anecdotes. There is romance: Mike Jones, a blacksmith (1801), brought the great Messenger to Goshen, and the tree under which the famous horse grazed still stands at the head of the home stretch; Hambletonian (1849-1876) was a discarded colt bought, with his aged dam thrown in, for $125 by Bill Rysdyk a farm hand; General Grant (1867) once drove Dexter (illustrated), the racing prodigy of that period.

Goshen was also a "first" in other spheres. The history-minded will want to know that trotting (fast walk) on a large scale was developed there as the major gait needed in the transfer of travel from saddles to wheels when roads were built—the only gait suitable for the sulky, tilbury, gig, buggy, surrey, and the milk wagon, which were changing the buzzing industrial whirl.

Then, as the author proudly says, Noah Webster (1758-1843) while teaching at the local academy wrote his famous blue-backed speller, the vanguard of *Webster's Unabridged Dictionary.*

The book is crammed with old prints of great horses, great men, and great events staged at Goshen. An insight into the development and life of an outstanding American community and sidelights on the lives of famous men and fine horses is the way it looks from here.—[*Cradle of the Trotter. By Elisabeth Sharts. Edited by Mildred Parker Seese. Photo Offset Printing. 248 pages. 137 illustrations. Book Mill, Goshen, N. Y. 1946. Price, $3.00.*]

Guide to Dissection of the Dog

The teaching of anatomy is undergoing a change. As an indication of that change, several veterinary colleges are using the dog as the animal of choice in teaching basic mammalian structure and terminology. It is believed that the dog affords an opportunity to reduce the student-specimen ratio, allowing each student more time to spend on actual dissection. At the same time, more material can be covered in a given interval because the smaller specimen can be handled, cleaned, and viewed more readily. There is the added advantage of economy, since a dog can be bought, preserved, and prepared for dissection at much less cost than either a horse or a cow.



—*Guide to Dissection of the Dog*

The change necessitated preparation of a dissection guide for students, and this manual was written to supply that need. Because it

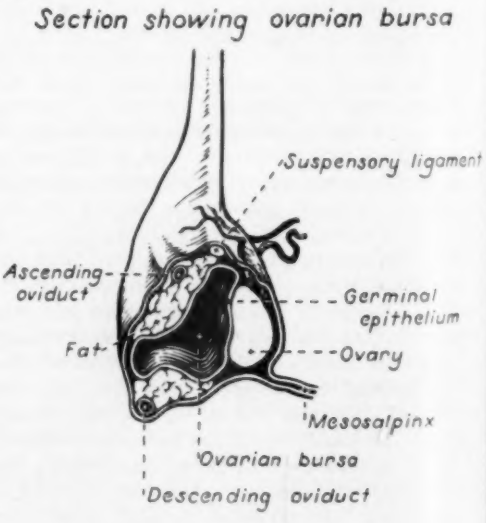


Fig. 117

—*Guide to Dissection of the Dog*

represents a radical departure from previous teaching methods, not only in regard to the animal used as the basis for study but also with regard to the plan of work, the entire text is new. The author has written clearly and concisely without overlooking important details. Excellent illustrations, which add greatly to the value of the text, were prepared almost entirely from dissection specimens.

Although the book was designed primarily for students, it would be a useful addition to every veterinarian's library.—[*Guide to the Dissection of the Dog. By Malcolm E. Miller, D.V.M., Ph.D. Head of the Department of Veterinary Anatomy, New York State Veterinary College. Paper. 417 pages. 148 figures. Lithoprinted by Edwards Bros., Ann Arbor, Mich., 1947. Price $4.50.*]

Food and Diet in the Mouryan Empire

The Mouryan Empire is approximately the area known in modern times as India. Its type of agriculture was what Mahatma Gandhi advised his people to restore as an essential means of regaining their pristine glory. The booklet depicts the Mouryan Empire in the years between 302 and 288 B.C. when (quoting) "more importance was attached to agriculture than in the India of modern times." It was a land of plenty. Famine never came and scarcity of food was never known. The slogan was "Agriculture must always flourish—May the Goddess reside in seeds and wealth." The cultivation of land was encouraged by granting facilities to the farmers. Vegetables, sugarcane, fruits, pumpkins, grapes, cascus roots, fragrant plants and medicinal herbs, rice, millet and other grain crops, vegetable oils, milk cows and work oxen, horses, bulls, buffaloes, sheep and goats, were all there on a generous scale to assure a high standard of living and security. Breeding, storage, distribution, feeding care, prices, professional and nonprofessional veterinary service were all described in treatises in Sanskrit. Cattlemen were insured against losses by theft, drowning, miring, lightning, and predatory animals (tigers, cobras, crocodiles.) The slaughter of bovine animals was prohibited. These were venerated for milk, butter, cheese, and farm power. Slaughters were supervised by public functionaries. Fishermen and dealers in food and firewood were licensed. [Lest the careless historian should blame the British Empire for the decline of India, there's but to recall the brutalities of Alexander the Great (326 B. C.), the conquest of the Mohammedans (8th century A. D.), and the Mongul occupation of the sixteenth century of this era which long preceded British rule. In despair, as the story goes, in the eighteenth century India appealed to European commercial interests (British and French) to set its house in order, and in 1858 it became a part of the British Empire.]

In ancient India, the manufacture and sale of intoxicating beverages were regulated by law. Temperance was enforced. The dehydrating of vegetables, breads, meat, and fish for preservation was a fine art as was also the balancing of rations from them.

Its conclusion signalizes the dawn of a New Era. The Gandhian way of life conceived the restoration of the Mouryan Empire of long ago through the scientific realism of the West. The little modest booklet adds a precious historical novelty to the AVMA library.—[*Food and Diet in the Mouryan Empire. By "Krishivala." Paper. 18 pages. Madras Chamber of Agriculture, 16 Broadway, Madras.*]

Housebreaking the Dog

The ability to combine nonchalance with wise-cracking and humility with dogma is a characteristic of Will Judy's writing that is aptly portrayed in this booklet. It tells when, how, and where to housebreak a dog in a way that ought to make any puppy owner smile rather than fuss at the task before him. It's a handy document to keep around the office for clients to read and a good one to recommend.— [*Housebreaking the Dog. 7th ed. By Capt. Will Judy. 16 pages, paper. 1947. Judy Publishing Company, Chicago. Price 30 cents.*]

The American Pharmaceutical Association announces the publication of the First Supplement to the National Formulary VIII. Included are certain revisions of the original text, replacements, and alternative formulas. Owners of the current National Formulary should state the serial number to be found in the front of their books when requesting the supplement. —[*First Supplement to the National Formulary VIII, eighth edition. Effective Nov. 1, 1947. 24-page pamphlet and index. American Pharmaceutical Association, 2215 Constitution Ave., N.W., Washington 7, D. C.*]

Labinthecountry is the name of a veterinary house organ circulated among veterinarians in the center of the Cornbelt, White Hall, Ill. It is published by, and in the interest of, The Gregory Laboratory at that address. It was founded by Dean Corsa, one of the early advocates of "graduates only" in the serum industry. *Labinthecountry* is packed with wit, wisdom, and good will.—*Free to veterinarians.*

Mundo Canino is the official organ of the Mexican Kennel Club. It is a monthly and is in its first volume. It is published at Colonia Cuahutemoc, Mexico, D. F. Price, $1.50 a year.

THE NEWS

San Francisco Meeting—Aug. 16-19, 1948

Special Convention Tour to Famous Western Vacationlands

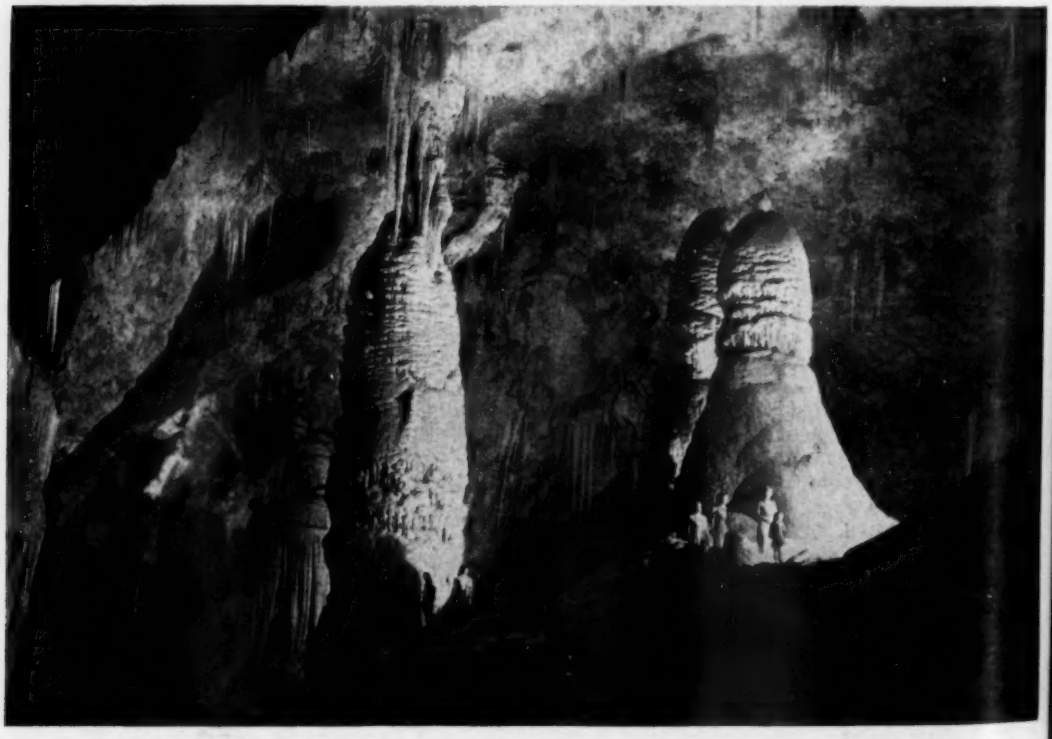
* * *

Southwest, Pacific Northwest, and Canadian Rockies Included in Itinerary

A scenic vacation tour, arranged by the AVMA through a leading travel agency, will be offered to veterinarians, their families, and guests attending the Association's 85th annual convention in San Francisco, Aug. 16-19, 1948.

Leaving from Chicago about a week before the convention opens, a special train or special cars (depending upon the size of the AVMA party) will follow the Golden State route to El Paso, Texas, for a tour of Carlsbad Caverns and an excursion across the International Bridge to Juarez, Mexico. The next stop will be Los Angeles, where a three-day program will include sightseeing in Hollywood, Beverly Hills, Pasadena, and Los Angeles, plus a dinner party at Earl Carroll's Theatre-Restaurant. Accommodations for the three nights in Los Angeles will be at the Biltmore Hotel. From Los Angeles, the party will travel overnight to San Francisco, arriving on Sunday, Aug. 15—a day before the convention opens. This will permit members of the party to get settled in their hotels and registered for the convention. It also will allow time for sightseeing in San Francisco and the bay area.

In San Francisco, the tour party will be "on its own" as far as hotel accommodations and other activities are concerned, since the con-



—*Santa Fe Railway*

Giant Dome and Twin Domes are located in the Big Room (625 ft. wide and ¾ mi. long) of Carlsbad Caverns. Giant Dome, 62 ft. high, is the world's largest stalagmite, growing 1 inch every century. Luncheon will be served 800 feet underground in this amazing cavern to those who travel via the official tour to the San Francisco meeting in August.

vention schedule will provide a full four-day program. Officers, Executive Board members, delegates, and others whose duties may require their arrival in San Francisco on Saturday, August 14, will leave Los Angeles a day early.

After the convention, the tour will offer a choice of three return routes: (1) north along the Pacific Coast to Portland, Seattle, and Vancouver, and on to Lake Louise and Banff in the Canadian Rockies; (2) *via* Glacier National Park, or (3) *via* Yellowstone Park.

The entire tour, from Chicago to Chicago, including the time spent at the convention, will take 17 to 19 days, depending upon the route selected for the return trip. Those who wish to take the "going" part of the tour but whose time will not permit them to take the full return tour may make more direct return arrangements from San Francisco.

Although the official tour will start from Chicago, arrangements will be made, as conditions indicate, for special cars out of Boston, New York City, Philadelphia, and Washington which will join with the AVMA tour in Chicago.

The tour will be on an "all expense" basis but will not include the time spent in San Francisco. Exact quotations on rates are not yet available, but assurance has been given that the prices will be both reasonable and competitive for the class of service provided. Folders describing the tour in detail are being printed and will be ready for distribution soon.

The meeting this year offers a rare opportunity to AVMA members, their families, and guests to join in a vacation trip that will be delightful and memorable. These few highlights of the tour are announced now so that members can start making plans. Additional information will appear in succeeding issues of the JOURNAL.

Hotel Reservations at San Francisco

A reservation blank and a street map showing location of hotels are on pages 30 and 31 (adv.) of this issue. These 15 leading hotels have contracted about 900 rooms, reservations for which must be cleared through the AVMA



—*Glacier National Park*

Glacier Park's colossal Garden Wall along the "Going-to-the-Sun Highway." Those who take the "official tour" to and from San Francisco will see the Garden Wall and many other fascinating scenic wonders in Glacier National Park on their return trip; or they may return via the Canadian Rockies or Yellowstone Park.

Housing Bureau, Dr. Nelson E. Clemens, chairman, at the address shown.

For those going on the special AVMA tour, the arrival time in San Francisco will be about 11:00 o'clock or earlier on the morning of Aug. 15. This time must be specified on the reservation request. Ample and satisfactory accommodations are assured at any of the hotels listed, all of which are within easy access of the meeting headquarters at the Palace. Please note that all requests must be accompanied by a deposit which has the advantage of holding the room on your arrival day, whatever the hour.

The following condensed schedule will aid in planning arrival times for all those who will attend the San Francisco session:

Saturday, August 14
a.m.—Board of Governors.
p.m.—Board of Governors.

Sunday, August 15
a.m.—Executive Board.
p.m.—Executive Board.
—Committee and group meetings.
—Early registration.
—Setting up of commercial and educational exhibits.

Monday, August 16
a.m.—Registration.
—Exhibits open.
—House of Representatives—first session.
—Various committee and group meetings.
p.m.—Opening session.
night—House of Representatives—second session.

Tuesday, August 17
a.m.—Regular convention schedule.

Wednesday, August 18
a.m., p.m.—Regular convention schedule.

Thursday, August 19
a.m., p.m.—Regular convention schedule.
p.m.—Adjournment.

The official tour party will leave San Francisco sometime during the evening of August 19.

AVMA Will Participate in Tropical Medicine Congress

When the Fourth International Congresses on Tropical Medicine and Malaria convene in Washington, D. C., May 10-18, 1948, the AVMA will be among the scientific societies officially represented there. Drs. R. A. Kelser, B. T. Simms, and J. G. Hardenbergh have been named as the Association's delegates.

The U. S. Department of State is sponsoring the conference, assisted by several other federal agencies and 15 leading scientific societies. Headquarters for most of the sessions will be the U. S. Departmental Auditorium.

The nine-day program will include 12 sections devoted to special fields of tropical medicine. At least two of these sections—tropical veterinary medicine, medical and veterinary entomology—will be of particular interest to veterinarians.

Because the international scope of this event affords an opportunity for broadening the influence and prestige of the American veterinary profession, the AVMA is hopeful that a large number of veterinarians will make arrangements to attend.

Further information about this meeting may be obtained by writing to: Executive Secretary, Fourth International Congresses on Tropical Medicine and Malaria, Division of International Conferences, Department of State, Washington 25, D. C.

A Motion Picture About a Veterinarian

A special committee was appointed by the Associated Serum Producers several months ago to select material for a motion picture showing what the work of the veterinarian means in the everyday life of each American, and to consult with the motion picture producers regarding the most advantageous method of producing the picture. This committee consisted of Drs. A. H. Quin, *chairman*, A. E. Bott, Frank Breed, W. D. Daugherty, H. E. Pinkerton, and J. D. Ray, with Mr. L. R. Fairall also an active member.

The efforts of these committee members resulted in the selection of Wilding Picture Productions to film the scenes of "Valiant Years." Members of the motion picture committee of the AVMA were invited to meet with this group from time to time, and Assistant Executive Secretary Klussendorf viewed all of the action shots with the committee. The scenario of



—*Wilding Pictures*

Dr. Wesley Kane, veterinarian, played by Mr. Norman MacKay in the motion picture, "Valiant Years."

"Valiant Years" was written by Mr. Joseph Cole, the veterinarian is called Dr. Wesley Kane, and the part is played by Mr. Norman MacKay.

Additional information about the general

theme and the availability for showing before veterinary and lay groups upon request from a veterinarian will be found on the editorial pages of the January JOURNAL.

Radio Programs Being Used Widely by Constituent Associations

A growing trend among constituent associations to utilize radio broadcasts to expand their year-around public relations programs is evident from the table below, which gives a partial list of the organizations participating in the 1948 veterinary broadcast series.

This series consists of 52 weekly broadcasts on animal health subjects, prepared in ready-to-use, radio script form by the AVMA Public Relations Department and issued to constituent associations without charge.

The series was started in 1943 and has brought countless favorable comments from the using organizations as well as from radio program directors and listeners. Many associations have expressed the opinion that this broadcast series is their best public relations medium.

Although more associations are using the programs this year than in years past, there are still many which are not taking advantage of this AVMA service—notwithstanding that they could make substantial contributions to the progress of their profession by doing so.

All members are urged to check the list below, and to encourage their state or provincial association to take part in this series if it is not presently participating. Some organizations have solved the problem of getting speakers to the broadcasting stations (which sometimes want to put on the programs at hours inconvenient to the speakers) by arranging to have transcriptions made several days or weeks in advance. In this way, the programs can be recorded at a time convenient for both the station and the veterinarians taking part in the presentation and broadcast whenever the station's schedule permits.

Partial Schedule of State and Provincial Association Broadcasts

State	Station	Location	Day of Week	Time	Name of Program
Delaware	WDEL	Wilmington	—	12:30 p.m.	"Farm & Home Hour"
Idaho	KIFI	Idaho Falls	Every Saturday	6:45 a.m.	"Farm Program"
Kansas	KSAC	Manhattan	—	—	"Extension Service Program"
Kansas & Missouri (coöperative)	KMBC	Kansas City	Every Saturday	12:30 p.m.	"Farm Hour"
Michigan	WKAR	East Lansing	Every Friday	1:15 p.m.	"Control of Diseases of Farm Animals"
New York	WJZ	New York City	—	—	"Farm News"
	WKNY	Kingston	Every Friday	1:00 p.m.	"Farm News Program"
North Carolina	WHKP	Hendersonville	Every Monday	12:45 p.m.	"Farm Program"
	WWNC	Asheville	Every Monday	12:45 p.m.	"Farm Hour"
Oklahoma	KVOO	Tulsa	Every Monday	5:45 a.m.	"Science Serving Agriculture"
Texas	WTAW	College Station	Every Monday	7:15 a.m.	"Veterinary Program"
Utah	Mutual System	—	Every Tuesday	6:45 a.m.	"Farm-Home Hour"
Wyoming	Various stations	—	—	—	—
British Columbia	CBR	Vancouver	Every Friday	12:00 noon	"Farm Program"
Manitoba	CKY	Winnipeg	Every Tuesday	1:30 p.m.	"CBC Farm Broadcast"
Ontario	CKCO	Ottawa	Every Wednesday	12:15 p.m.	"Agricultural Club"
Quebec	CKAC	Montreal	—	12:30 p.m.	"Programme rural"
	CBF	Montreal	—	12:00 noon	"Réveil rural"
Saskatchewan	CJRM	Regina	—	7:00 p.m.	"Farm Programme"

National Veterinary Association of Cuba Affiliates with AVMA

The application of the *Colegio Medico Veterinario Nacional*, national veterinary association of Cuba, for constituent membership in the AVMA was recently approved by the Executive Board. It becomes the fifty-ninth organization so recognized, the others comprising the veterinary associations in the 48 states and the District of Columbia; five provincial associations in Canada, the associations in the Panama Canal Zone and Puerto Rico, the National Association of Federal Veterinarians, and the U. S. Army Veterinary Corps, all of which are entitled to delegates in the AVMA House of Representatives.

The National Veterinary Medical Association of Cuba has a membership of nearly 600, most of whom are graduates of the University of Havana. It comprises six provincial associations in Pinar del Rio, Havana, Matanzas, Las Villas, Camaguey, and Oriente and is organized similarly to the AVMA. It holds a national congress or convention annually. The executive secretary of the Cuban Association is Dr. Angel M. Morales of Havana.

Colorado Student Chapter Officers

The student chapter of the AVMA at Colorado A. & M. College has elected its officers for the winter quarter, 1948. The *president* is Roger A. Grant; Dale Karre, *president-elect;* Dick McClellan, *vice-president;* Walton Hawk, *secretary;* L. A. Grinner, *treasurer;* and John A. Cannes, *reporter.*

s/W. F. HUTCHINSON, *Secretary.*

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BECKER, LOUIS R.
410 N. 7th Ave., Phoenix, Ariz.
D.V.M., Alabama Polytechnic Institute, 1942.
Vouchers: E. L. Stam and C. H. Bugbee.

DE HOLL, JOHN C.
217 N. 6th St., Birmingham, Ala.
D.V.M., Iowa State College, 1938.
Vouchers: K. U. Jones and R. P. Lusco.

EVANS, JOHN W.
Box 74, Carthage, Tenn.
D.V.M., Alabama Polytechnic Institute, 1941.
Vouchers: S. A. Berry and C. W. Evans.

GINGRAS, GEORGE E.
Fort Covington St., Malone, N. Y.
D.V.M., New York State Veterinary College, 1932.
Vouchers: J. R. Regan and R. D. Walker.

HAGGERTY, LAURENCE V.
229 Atlantic Ave., Apt. 206, Long Beach, Calif.
D.V.M., McKillip Veterinary College, 1914.
Vouchers: G. W. Closson and M. M. Johnson.

HERRADA L., MANUEL
Calle 19 No. 601, esq. a C, Vedado, Havana, Cuba.
D.V.M., University of Havana, 1934.
Vouchers: M. Valdes F. and M. Stincer.

O'HARRA, GUY L.
Box 826, Merced, Calif.
D.V.M., Kansas City Veterinary College, 1918.
Vouchers: A. C. Rosenberger and W. A. Browne.

TURKHEIMER, BRUNO
1730 18th Ave., San Francisco 22, Calif.
D.M.V., Ludwig Maxmilian's University at Munich, Germany, 1915.
Vouchers: J. M. Arburua and G. B. Henno.

WARD, NORMAN R.
597 Park Ave., Worcester, Mass.
D.V.M., Iowa State College, 1944.
Vouchers: R. O. Delano and W. V. Lumb.

Second Listing

Faulbaum, Otto G., 505 East "B" St., Belleville, Ill.

Fischer, John A., Duncan, British Columbia, Can.

Higginson, John W., Box 131, Boissevain, Man., Can.

Hurst, Fred M., Oxford, Iowa.

Kelly, Crosby, 2924 Mills Ave., N.E., Washington, D. C.

McQueen, Oscar D. A., 5960 Kensington Rd., Detroit 24, Mich.

Padilla B., Manuel R., Escuintla, Guatemala, C. A.

Panagiotidis, Harry N., Apartato 267, Santiago, Dominican Republic.

Smith, Ray F., Boswell, Ind.

Stong, Jacob, 3012 McPherson St., Apt. A, Ft. Worth, Texas.

Williams, Firmin E., Box 251, Edna, Texas.

1948 Graduate Applicants

First Listing

The following are graduates who have recently received veterinary degrees and who have applied for AVMA membership under the provision granted in the administrative By Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute

BAETZ, N. ANNELDA, D.V.M.
1121 Mason St., San Antonio 8, Texas.
Vouchers: N. D. Crandall and I. S. McAdory.

"The Golden Gate in '48"

BYRON, HENRY B., D.V.M.
Box 484, Green Cove Springs, Fla.
Vouchers: E. S. Winters and I. S. McAdory.

CALLIS, JERRY J., D.V.M.
Sasser, Georgia.
Vouchers: R. S. Sugg and I. S. McAdory.

DIXON, CHARLES R., D.V.M.
Thomasville, Georgia.
Vouchers: R. S. Sugg and I. S. McAdory.

GITTINGS, BEN L., D.V.M.
N. Howell Ave., Brooksville, Fla.
Vouchers: R. S. Sugg and I. S. McAdory.

GURLEY, CLAYBRON H., D.V.M.
304 Peachtree St., Johnson City, Tenn.
Vouchers: R. S. Sugg and I. S. McAdory.

HAMLIN, HOMER H., D.V.M.
Aliceville, Alabama.
Vouchers: R. S. Sugg and I. S. McAdory.

KITTRELL, BELMONT K., D.V.M.
Robersonville, N. Carolina.
Vouchers: J. F. Hokanson and W. J. Gibbons.

LASDAY, RICHARD M., D.V.M.
829 San Marco Blvd., Jacksonville, Fla.
Vouchers: N. D. Crandall and I. S. McAdory.

LEWIS, ROBERT Y., D.V.M.
2104 31st St. W., Birmingham, Ala.
Vouchers: R. S. Sugg and I. S. McAdory.

MCAFEE, O. LUTTRELLE, D.V.M.
Wrightsville, Georgia.
Vouchers: N. D. Crandall and I. S. McAdory.

MEREDITH, JOHN S., D.V.M.
Statesville, N. Carolina.
Vouchers: R. S. Sugg and I. S. McAdory.

O'CONNOR, THOMAS J., D.V.M.
Chauncey, Georgia.
Vouchers: R. S. Sugg and I. S. McAdory.

THOMAS, WILLIAM L., D.V.M.
906 Broadway Ave., Little Rock, Ark.
Vouchers: N. D. Crandall and I. S. McAdory.

THOMPSON, BOB C., D.V.M.
709 S. Main St., Columbia, Tenn.
Vouchers: N. D. Crandall and I. S. McAdory.

Michigan State College

BRUNN, WILLIAM H., D.V.M.
2820 Telegraph Rd., Dearborn, Mich.
Vouchers: E. K. Sales and F. Thorp, Jr.

University of the Philippines

SHER, HERMAN, D.V.M.
711 James St. N.S., Pittsburgh 12, Pa.
Vouchers: A. K. Gomez and L. D. Barrett

COMMENCEMENT

Alabama Polytechnic Institute

At the commencement exercises for the Alabama Polytechnic Institute on Dec. 17, 1947, the following candidates were presented for the D.V.M. degree.

Joseph N. Altmyer	Charles Rice Dixon
N. Annelda Baetz	Ben Louis Gittings
Ralph Beauchamp	Claybron H. Gurley
Henry Brow Byron	Homer H. Hamlin
Jerry J. Callis	George M. Hughes
Warren Hunt	John Scott Meredith
Belmont A. Kittrell	Carlton Hiram Myers
Wilmer W. Knight	Thomas O'Connor
Richard M. Lasday	Jose Louis Soler
James Alex Leech	William L. Thomas
Robert Young Lewis	Bob C. Thompson
O. Luttrell McAfee	Samford E. Thrower

Bronze C. Youmans

The following students will receive their diplomas after completion of five hours of English by correspondence:

Charles Bradley	Carl M. Sellars

U. S. GOVERNMENT

Honor Canadian Scientist.—Dr. C. A. Mitchell, Dominion animal pathologist, Animal Disease Research Institute at Hull, Quebec, was granted the Medal of Freedom by the U. S. War Department in recognition of four years of work with the Joint United States-Canadian Commission at Grosse Isle where studies were made of wartime protection against rinderpest, foot-and-mouth disease, and bovine contagious pleuropneumonia. The citation reads:

Citation for Medal of Freedom.—Dr. C. A. Mitchell, Dominion Pathologist, Animal Disease Research Station, Department of Agriculture, Hull, Quebec, Canada, rendered outstanding and exceptionally meritorious service as a Canadian member of the Joint United States-Canadian Commission from June, 1942, to February, 1946. Dr. Mitchell utilized his superior ability as an administrator and his high degree of attainment as a scientist in a meritorious and commendable manner in advancement of the war effort of the United States.

AMONG THE STATES AND PROVINCES

Arizona

Personal.—Dr. K. O. Lassen (KSC '36) will use a radiant floor heating installation in the construction of his veterinary office and hospital in Mesa. According to the architect, Harry Herrscher, and Melvin Ensign, associate, it will be the first commercial structure in the state to feature the installation, in which hot water circulates through coils in the concrete floors. The 1,500 sq. ft. of floor space will be divided into reception room, x-ray room, office, surgery, detaining wards, and runways for small animals. Dr. Lassen practised in Mesa prior to four years of Army veterinary service.

s/R. L. MCCOMB, JR., *Resident Secretary.*

California

State Association.—The midwinter conference of the California State Veterinary Medical Association was held at the Anderson Hotel, San Luis Obispo, Jan. 5-7, 1948. Following the introductions and a radio broadcast of the con-

ference opening, the speakers and their subjects were:

Dr. R. C. Klussendorf, assistant executive secretary of the AVMA, Chicago, Ill.: "Reproductive Disorders in Cows" and "AVMA Activities and Problems."

Dr. E. R. Frank, Kansas State College, Manhattan: "Bovine Surgery," "Equine Surgery," and "Equine Lameness."

Dr. F. B. Pulling, Jr., Atascadero: "Observation of Arabian Horses in the Near East."

Mr. S. A. Peoples, professor of comparative pharmacology, University of California, Davis: "Pharmacological Studies on Stimulants with Reference to Thoroughbred Horses."

Dr. A. K. Carr, adminstrator, Division of Animal Industry, State Department of Agriculture, Sacramento: "California Brucellosis Vaccination Law."

Dr. A. K. Kuttler, in charge, Tuberculosis Eradication Division, U. S. BAI, Washington, D. C.: "Recent Developments for More Uniform Procedures in Brucellosis and Tuberculosis Eradication."

Dr. R. A. Bankowski, Division of Veterinary Science, University of California, Berkeley: "Sulfonamides in the Control of Poultry Diseases."

Dr. James H. Steele, chief, Veterinary Public Health Division, U. S. Public Health Service, Atlanta, Ga.: "The Relationship of Veterinary Medicine to Public Health."

Dr. W. D. Daugherty, director, Veterinary Medical Department, Allied Laboratories, Indianapolis, Ind.: "Intravenous Medication in Veterinary Practice."

Mr. Walter L. Bower, assistant attorney general, State of California, Los Angeles: "Veterinary Jurisprudence."

Mr. William L. Jellison, parasitologist, Rocky Moutain Laboratory, U. S. Public Health Service, Hamilton, Mont.: "A Possible Effect of Specialization upon the Transmission of Diseases of Mammals."

Dr. E. C. Baxter, Los Angeles: "Importance of Diagnosis."

Dr. K. W. Smith, Sioux City, Iowa: "Problems of Diagnosis in Small Animal Practice" and "Present Day Methods in Small Animal Therapy."

Dr. Myron Thom, Pasadena: "Some Practical Aspects of Radiography and Radiotherapy."

Dr. W. K. Riddell, Los Angeles, and Dr. P. L. McClave, Hollywood: "Reduction of Fractures by External Skeletal Fixation."

Dr. H. A. Seidentopf, director, Fromm Laboratories, Grafton, Wis.: "Diseases Resembling Canine Distemper."

Dr. O. G. Ravin, ophthalmologist, San Diego: "Cataracts in Small Animals."

Drs. O. W. Schalm and K. G. McKay conducted a "Mastitis School" in conjunction with the conference, which included an illustrative demonstration of the Hotis test, an evaluation of the efficiency and limitations in the use of the Hotis test and microscopic studies in diagnosis, microscopic examination by Kodachrome projection, and selected milk samples showing types of Hotis reactions.

The banquet program, with Dr. Harvey W. Campbell as toastmaster, featured remarks by President Julian McPhee of California State Polytechnic College; an address by Dr. G. H. Hart, head of the Animal Husbandry Division, University of California, entitled "The Relation of Progress in Science to the Veterinary Practitioner;" and music by the California Polytechnic College Musical Organization, under the direction of H. P. Davidson.

The San Luis Obispo meeting was well attended—260 registered and 283 attended the banquet.

S/CHARLES S. TRAVERS, *Secretary.*

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Associations Consolidated.—The Small Animal Veterinary Medical Association of Southern California has merged with the Southern California Veterinary Medical Association, bringing the total membership of the new organization to almost 200. The move will result in a more unified organization for veterinarians of the area. A joint meeting of the two groups was held in December to elect officers and to choose a suitable meeting place. "Eczemas and Their Possible Relation to Allergies" was discussed by C. C. Coghlan, M. D.

The officers for 1948 are: Dr. W. K. Riddell, *president;* Dr. A. M. Scott, *vice-president;* and Dr. H. I. Ott, *secretary-treasurer.*

S/N. L. MCBRIDE, JR.

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Civil Service Positions.—On Feb. 10, 1948, examinations will be held by the California State Personnel Board for the position of assistant livestock pathologist, in San Francisco, Sacramento, Los Angeles, and such other places as the number of candidates warrant. On February 21, examinations will be held for laboratory technicians and a mosquito control specialist, in the same places of examination. The final date for filing applications is Jan. 31, 1948, and the address is State Personnel Board, 1015 L Street, Sacramento.

The salary range for meat inspectors has been increased. The new range is $325-341-358-376-395 per month. Several openings for veterinary meat inspectors have occurred. Anyone interested should write to Dr. Geoffrey A. Boyd, Chief, Bureau of Meat Inspection, State Department of Agriculture, Sacramento.

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Increasing Livestock Imports.—The increase of the state's population from 6,900,000 in 1940 to 9,400,000 in 1947, and the predicted population of 14,000,000 by 1960, earmarks California as a great outlet for livestock from the surrounding states and certainly justifies the attention given to veterinary science. The imports of livestock into the state in 1946 were: 663,000 cattle for slaughter; 633,000 cattle and calves; 1,297,000 hogs for slaughter; 1,204,000 sheep and lambs for slaughter; and 449,000 stock sheep and lambs.

The figures for the first ten months of 1947 indicate that the total for the year will show considerable increase over those of 1946. The livestock situation has stimulated the expansion of irrigated pastures which now total 400,000 acres compared with but a few thousand in 1930.

Dr. McNair Retires.—Dr. Fred H. McNair (CORN '05) of Berkeley writes: "Enclosed is a check for my 1948 dues. Although now retired, I am still interested in the welfare of the profession. In August, 1946, I passed the torch to younger men which seemed wise after forty years, thirty-nine at Berkeley. In addition to conducting an extensive practice, I taught veterinary subjects for two years and served twelve years as city veterinarian and milk inspector and as a member of the Advisory Board of Health. Now I am occupied on our small ranch and supervising our Children's Pet Show which I've had the honor to father for twenty years."

Delaware

State Association.—The annual meeting of the Delaware Veterinary Medical Association was held in Wolfe Hall, University of Delaware, Newark, on December 4. Speakers featured on the program were:

Dr. R. H. Baker: "The Growth and Importance of the Poultry Pathological Laboratory."

Dr. J. L. Cherry, Dover: "A Veterinarian's Experience in Public Health Service."

Dr. J. D. Beck, professor of veterinary medicine, University of Pennsylvania, Philadelphia: "X-Disease of Cattle" (with motion pictures).

Motion pictures were shown on swine erysipelas and equine infectious anemia.

The officers for 1948 are: Dr. M. L. Zurkow, Dover, *president;* Dr. G. G. Rosenberger, Wilmington, *secretary-treasurer;* and Drs. Harvey Fell, Wilmington; J. L. Cherry, Dover; and J. R. West, Milford, *executive board.*

s/G. G. ROSENBERGER, *Secretary.*

Florida

Personal.—Dr. Ronald F. Jackson (MSC '40) was elected city commissioner of St. Augustine on Dec. 2, 1947, by a considerable margin over his opponent. Dr. Jackson headed the local committee for the eighteenth annual meeting of the Florida Veterinary Medical Association, held in St. Augustine in October, 1947.

Georgia

Dairy Science Association.—The American Dairy Science Association will meet at the state university in Athens, June 14-16, 1948, for the first session that national society has held further south than Kentucky. The president is Prof. Paul H. Tracey, of the University of Illinois. An attendance of 600 is expected. —*From Science, Nov. 28, 1947.*

Illinois

Central Association.—The November 13 meeting of the Central Illinois Veterinary Medical Association was held in the Elks Club at Springfield. The speakers on the program were:

L. M. Schuman, M.D., State Department of Public Health, Springfield: "Relation of Animal Diseases to Public Health."

Dr. J. O. Alberts, University of Illinois, Urbana: "Mastitis."

Dr. C. D. Van Houweling, Illinois Agricultural Association, Chicago: "What the Dairyman Expects from His Veterinarian."

Dr. Robert Graham, dean, College of Veterinary Medicine, University of Illinois, Urbana: "Veterinary Education."

The officers for 1948 are Dr. L. J. Miller, Lincoln, *president;* Dr. A. L. Starkey, McLean, *vice-president;* Dr. C. A. Lemen, Warrenburg, *secretary-treasurer* (reëlected).

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Visiting Lecturer at Veterinary School.—Dr. Niels O. Rasbech, assistant professor of veterinary medicine, Royal Veterinary and Agricultural College, Copenhagen, Denmark, began work in December as visiting lecturer and counselor in the College of Veterinary Medicine, University of Illinois, Urbana. Dr. Rasbech has studied at the Royal College, the Danish State University at Aarhus, and the University of Copenhagen. As a member of the Danish Military Veterinary Corps, he was disarmed and interned with the Corps and released in October, 1943. He is a member of the Danish professional organizations in his field and has contributed a prize work to the literature on bovine reproduction.

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Pullorum Disease in Poults.—Most of the disease losses among Illinois turkey poults in 1947 were attributed to pullorum disease in a survey conducted by veterinarians of the state university. As a cause of death losses, nutritional diseases were rated second.

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Druggists vs. Farm Bureau.—Legislation to prevent Farm Bureau coöperatives from selling hog-cholera products at less than regular retail prices is being sought by the state pharmaceutical association, a drug trade paper reports. Druggists are unable to meet the price competition, which has forced many to discontinue the sale of these products.

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Personal.—Dr. C. J. Voelker (KSC '42) of Pittsfield addressed the Boot and Saddle Club on November 25 at the home of Mr. C. W. Kaylor, in the first of a series of special lectures on the horse. His subject was "Diseases and Injuries to the Horse."

Indiana

State Association.—The Indiana Veterinary Medical Association held its annual meeting on Jan. 15-17, 1948, at the Severin Hotel in Indianapolis. The scientific program featured the following speakers:

Dr. R. F. Smith, Boswell: "Report of the State Veterinarian."

Dr. C. K. Mingle, U. S. BAI, Washington, D. C.: "Correlation of Research with Brucellosis Control."

Dr. Raymond Fagan, Indianapolis: "Brucellosis and Rabies in Public Health Work in Indiana."

Dr. R. M. Hofferd, Cedar Rapids, Iowa: "Differential Diagnosis in Swine Diseases."

Dr. John H. Knapp, Columbus, Ohio: "Small Animal Practice with Emphasis on the Distemper Complex" and "Clinical Demonstrations."

Dr. Elizabeth A. Clark, University of Wisconsin, Madison: "X-Ray Technique in Diagnosis and Therapeutics" and "X-Ray Slides for Comparative Study."

Dr. John G. Hardenbergh, executive secretary, AVMA, Chicago, Ill.: "Whence and Whither."

Dr. W. M. Coffee, LaCenter, Ky.: "Business Management of a Mixed Practice."

Dr. C. O. Petry, Ossian: "Importance of the Various Phases of Cattle Practice."

Dr. C. F. Clark, state veterinarian, Lansing, Mich.: "Bovine Sterility."

Dr. F. H. Fox, New York State Veterinary College, Cornell University, Ithaca: "The Mastitis Problem."

Mr. Lyman Peck, feed consultant, Chicago, Ill.: "Some Observations on Livestock Feeding."

Dr. O. C. Shockley of New Ross was the chairman of a panel discussion on "Poisoning in Livestock," assisted by Drs. A. C. Spivey, Thorntown; S. H. Regenos, Zionsville; T. A. Sigler, Greencastle; and H. M. Bratt, Terre Haute.

The ladies auxiliary was entertained at a reception and cards, at a luncheon, and at the banquet and dance. Dr. H. W. Dempsey was the toastmaster at the banquet, and the Indiana Elks Chanters provided the entertainment.

s/H. A. LIDIKAY, *Secretary.*

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Personal.—Dr. H. A. Lidikay (OSU '29) of Darlington was featured in the "Going Places" section of *Pic* magazine for January, 1948. This section touches on the outstanding activities of young men in various professions and businesses, and Dr. Lidikay was cited for the care, equipment, and fine methods exemplified in his small animal hospital, in addition to the substantial practice he carries on among food-producing animals. His work as secretary-treasurer of the Indiana state association and his contributions to the profession in general are mentioned.

Iowa

East Central Society.—Thirty-eight veterinarians attended the dinner meeting of the East Central Iowa Veterinary Medical Society held on December 11 at the Hotel Roosevelt, Cedar Rapids. President J. B. Bryant of the state association opened the program with a talk on the services of that organization. The technical program proceeded as follows:

Dr. F. J. Crow, Iowa City: "Report on the Fifty-first Annual Meeting of the U. S. Live Stock Sanitary Association, Chicago, Dec. 3-5, 1947."

Dr. L. A. Frazer, Des Moines: "Foot-and-Mouth Disease Control in Mexico."

Dr. L. Proctor, Oelwein: "Wintertime Diseases of the Dairy Cow."

Dr. W. S. O'Brien, Ryan: "Penile Injury of a Bull Serving a Small Heifer" and "Severe Metritis Following Calving."

Dr. S. G. Paul, Clarence: "Successful Delayed Treatment of Parturient Paresis."

Dr. R. E. Savage, Monticello: "Hardware Disease Causing Indigestion."

Dr. J. E. Riggenbach, Williamsburg: "Case Reports on Acetonemia and Albuminuria."

Dr. H. E. Hanna, Springville: "Sodium Fluoride Poisoning in a Cow."

Dr. J. W. Giffee, Cedar Rapids: "Sodium Fluoride Poisoning in Swine."

Dr. G. A. White, Riverside: "Salt Poisoning of Recently Vaccinated Shoats."

Dr. R. B. Helming, Cresco: "Albuminuria in Cattle" and "Case Report on Finding Wire in the Apex of the Heart in a Cow."

s/O. L. HAIGHT, *Secretary.*

Kansas

Six-Year Curriculum Approved.—Kansas State College at Manhattan has officially approved a six-year curriculum in veterinary medicine. The provisions of the course are as follows:

1) Students seeking admission in September, 1948, will still be admitted if they have credit for one year of preveterinary work.

2) Students seeking admission in September, 1949, will have to present evidence of having completed two years of preveterinary work.

3) The new professional curriculum also becomes effective in September, 1949; or in other words 1953 graduates will be the first to have completed the requirements of the new six-year curriculum.

4) Students completing the six-year curriculum will be granted concurrently the degrees Bachelor of Science and Doctor of Veterinary Medicine.

Kentucky

State Association.—The winter meeting of the Kentucky Veterinary Medical Association was held at the University of Kentucky, Lexington, Dec. 10-11, 1947. The program featured the following speakers:

Dr. W. P. Garrigus, University of Kentucky, Lexington: "Feeding Farm Animals."

Mr. A. B. Poundstone, University of Kentucky, Lexington: "Feed Control."

Dr. F. E. Hull, University of Kentucky, Lexington: "Swamp Fever."

Dr. L. G. Northington, Mayfield: "Anthrax."

Dr. W. R. McGee, Lexington: "Kentucky's Program for the Control of Swamp Fever."

A banquet was held at the Phoenix Hotel on December 10, and the following morning was devoted to the business meeting.

s/T. P. STRITTMATTER, JR., *Secretary.*

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Precautions against Swamp Fever.—This state has set up a rigid policy governing the admission of horses released from the swamp fever quarantine at Rockingham Park in New Hampshire. Horses being brought into Kentucky from Rockingham, or from any other place where swamp fever occurred in 1947, are subject to isolation and inoculation test, under direction of the state veterinarian, prior to being allowed free movement in the state. New arrivals from infection areas must be reported to the state veterinarian within twelve hours after entry into Kentucky.—*The Blood-Horse, Nov. 15, 1947.*

"The Golden Gate in '48"

Louisiana

Short Course.—The Louisiana Veterinary Medical Association held its seventeenth annual short course, conducted by the Louisiana State University, at Baton Rouge on Jan. 27-28, 1948. The Rev. P. W. Wilson delivered the invocation. Dean Fred C. Frey of the University welcomed the guests; Dr. W. E. Brewer responded; and Dr. E. J. Meixel, president of the Association, addressed the group. The followng speakers comprised the scientific program:

Dr. W. A. Hagan, president of the AVMA, and dean of the New York State Veterinary College, Ithaca: "Rabies and Its Control."

Dr. C. H. Covault, Iowa State College, Ames: "Diagnosis and Control of Infectious Diseases of Small Animals" and "Small Animal Practice."

Dr. E. A. Davis, Columbus, Ga.: "The Dairy Calf and Its Problems" and "Some Every Day Problems in Beef and Dairy Cattle Practice."

Mr. J. G. Lee, Jr., dean, College of Agriculture, Louisiana State University: "Livestock Improvement for Indiana."

Dr. W. L. Treuting, president, State Board of Health, New Orleans: "Encephalomyelitis and Allied Diseases in the Human Being."

Dr. C. H. Covault was the moderator in a panel discussion on "Encephalomyelitis." Participants in the panel were Drs. W. L. Treuting, E. A. Davis, Louis Leonpacher, Sam Liggin, Gifford Hargis, W. S. Hornsby, and A. T. Prescott.

Motion pictures shown were "Swamp Fever," furnished by the U. S. BAI, with remarks by Dr. E. P. Flower; and "No Hand Stripping," from the Babson Brothers Co. of Texas, presented by Mr. R. L. Rook.

Dr. J. A. Goodwin was the toastmaster at the banquet, Dr. W. A. Hagan the speaker, and entertainment was provided by Messrs. Justin Wilson and Pike Burden.

Dr. Clara Tucker was the guest speaker at the luncheon for the ladies auxiliary held at the Faculty Club on the campus.

s/C. M. HEFLIN, *Secretary.*

Maine

Conquering Brucellosis.—Amid the pessimism one hears about the brucellosis situation comes a cheerful report from Dr. J. F. Witter, animal pathologist of the state university *(Hoard's Dairyman*, Nov. 25, 1947), showing that nine out of Maine's 16 counties are free of bovine brucellosis and in the seven others the morbidity is less than 2 per cent; that veterinarians throughout the state receive fewer calls for retained placenta and metritis than formerly; and that cattlemen within the state are buying cows with more confidence in their health. The reasons cited for the favorable situation are (1) the general agreement that the disease should be controlled, (2) the state's sound program, and (3) the close coöperation with the U. S. BAI.

Maryland

Ornithosis from Pigeons.—Nearly all of the human cases of ornithosis (=psittacosis) diagnosed in Baltimore were traced to privately owned pigeons, although exposure to wild pigeons in public parks was not excluded since infected wild pigeons were found in four out of eight locations investigated.—*From Public Health Reports, Sept. 26, 1947.*

Michigan

Southeastern Association.—The Southeastern Michigan Veterinary Medical Association met on December 10 at the Herman Keifer Hospital in Detroit. Dr. W. S. Shute of Guelph, Ontario, discussed the use of alpha-tocopherol. Dr. F. D. Egan, Farmington, discussed the mechanics of canine autonomy and caudotomy.

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Western Association.—The Western Michigan Veterinary Medical Association met on December 11 at DeWitt's Dutch Kitchen at Grand Rapids. The program consisted of speakers from the veterinary school of Michigan State College. Dr. C. S. Bryan was master of ceremonies, and Drs. W. O. Brinker, J. P. Newman, F. Thorp, W. F. Riley, and Mr. Gray participated in the following subjects: small animal gynecology, bone surgery, enteric diseases of swine, and listerellosis of large animals.

Forty-three veterinarians, their wives, and guests brought the total number present to 70.

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Fur Association.—The Michigan-Ohio International Fur Breeders Association for fox and mink held its seventeenth annual meeting in Grand Rapids on Nov. 25-28, 1947. Dr. L. B. Sholl of the Department of Animal Pathology, Michigan State College, East Lansing; Dr. T. T. Chaddock of the Fromm Laboratories, Grafton, Wis.; and Dr. B. R. McCrory of the Purina Manufacturing Co., St. Louis, Mo., were the official veterinarians for this show.

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Bacteriologists Meet.—The Michigan Society of American Bacteriologists met on December 12 at the Herman Keifer Hospital, Detroit. A paper entitled "The Isolation of Listerella from the Bovine Brain" by Mr. M. L. Gray, Dr. H. J. Stafseth, and Dr. Frank Thorp, Jr., of the veterinary school, Michigan State College, East Lansing, was presented, after which a discussion took place.

s/FRANK THORP, JR., *Resident Secretary.*

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Unusual Case of Trichinosis.—The Department of Pathology, University of Michigan, reports a human case of trichinosis in which living parasites (including gravid females) were present in the intestine fifty-four days after the infected pork was eaten. Raw pork sausage, made from a hog the victim had butchered for home use, was the source of the infection. He, a tavern keeper, 35, and a daughter, 8, died. Other members of the family and neighbors who ate the meat raw also contracted the disease. The pathologic importance of the case was reportedly the long period during which larvae were released in the intestine.—*Abstr. J. Am. M. A., Dec. 13, 1947: 1028.*

Minnesota

Honors to Drs. Feldman and Hinshaw.—The prominence gained by streptomycin in the

treatment of human tuberculosis is a reminder that William H. Feldman and H. Corwin Hinshaw, of the Mayo Clinic and Karl Pfeutze Mineral Springs Sanitorium at Cannon Falls, were granted the Certificate of Merit for their exhibit of "Streptomycin, Experimental and Clinical Observations" at the centennial meeting of the American Medical Association at Atlantic City last year.

Missouri

Kansas City Association.—On December 16, the Kansas City Veterinary Medical Association met at the Hotel Continental to hear Dr. J. W. Cunkelman, Fort Dodge Laboratories, Inc., Fort Dodge, Iowa, speak on "Breeding Unsoundness in Cattle." A discussion of the featured subject and general practice problems followed.

s/GAIL B. SMITH, *Secretary.*

Nebraska

The Reason Is Evident.—"The state's strong association of veterinarians is currently opposing a plan to incorporate a course on veterinary medicine in the University of Nebraska pharmacy school."—*Drug Topics, Jan. 5, 1948.*

New York

New York City Association.—The Veterinary Medical Association of New York City met on January 7 at the Hotel Pennsylvania for a clinico-pathological conference. Dr. Frank Bloom, associate in pathology, Long Island College of Medicine, was the pathologist. The clinicians were Dr. Hadley C. Stephenson, professor of materia medica and small animal diseases, New York State Veterinary College, Ithaca; and Dr. Mark Allam, assistant professor of veterinary surgery, School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

s/C. R. SCHROEDER, *Secretary.*

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Conference for Veterinarians.—The New York State Veterinary College, Cornell University, Ithaca, held its fortieth annual conference for veterinarians on Jan. 1-3, 1948, on the campus. The following speakers appeared on the program:

Dr. H. C. Stephenson: "The Application of the Kirshner-Ehmer Splint."

Dr. W. C. Glenney, Elgin, Ill.: "Eight Years of Field Research with Distemperoid Virus (Green Method)" and "The Value of Hemograms in the Differential Diagnosis of Diseases of Dairy Cattle."

Dr. S. F. Scheidy, Sharpe and Dohme, Inc., Glenolden, Pa.: "Recent Developments in Sulfonamide Therapy."

Dr. Carl W. Walter, Peter Bent Brigham Hospital, Boston, Mass.: "Aseptic Operating Room Technique."

Drs. T. H. Brasmer, C. A. Taylor, and H. C. Stephenson: "A Preliminary Report on the Clinical Use of Bovine Serum Albumin in the Dog."

Dr. A. H. Kennedy, Department of Fur Bearing Animals, Ontario Veterinary College, Guelph: "The Veterinarian's Approach to Disease Problems in Mink."

Dr. W. A. Hagan, dean, New York State Veterinary College, and president, AVMA: "The Advancement of Veterinary Education."

Dr. Frank L. Meleney, Department of Surgery, College of Physicians and Surgeons, Columbia University, New York City: "The Use of Antibiotics in the Treatment of Surgical Infections."

Dr. J. A. Baker: "Spirochetal Infections in Animals."

Dr. W. N. Plastridge, University of Connecticut, Storrs: "Vibrionic Abortion in Cattle."

Dr. J. P. Delaplane, Poultry Husbandry Department, Rhode Island State College, Kingston: "The Prophylactic Use of Sulfaquinoxaline for Chronic Fowl Cholera."

Dr. R. W. Bratton, Animal Husbandry Department, Cornell University: "Breeding Behavior, Spermatogenesis, and Semen Production of Bulls Fed Rations Low in Carotene."

Dr. P. M. Runge, Boston, Mass.: "Surgery of the Animal Eye."

Dr. David Walker, Morrisville, Vt.: "Problems of Cattle Practice."

Dr. W. S. Stone, Bureau of Animal Industry, Albany, and president of N.Y.S.V.C. Alumni Association: "Presentation of Portrait of Earl Sunderville."

President E. E. Day, Cornell University: "Acceptance of Portrait."

Dr. Earl Sunderville: "Response."

Dr. H. E. Hilleboe, commissioner of health, New York State Health Department, and chairman of the State Food Commission, Albany: "Public Health and the Practice of Veterinary Medicine."

Dr. S. J. Roberts: "Foot Rot in Cattle—A Small Controlled Experiment."

Drs. D. W. Baker and J. H. Whitlock: "Diagnosis of Parasitic Diseases."

Dr. W. N. Plastridge, University of Connecticut, Storrs: "Mastitis Control in Connecticut." Discussion by Drs. Niels Pieper, Middletown, Conn., and F. F. Bushnell, Manchester, Conn.

Dr. E. W. Tucker: "Field Observations on Mastitis Control."

A panel discussion on small animal diseases was presented by Drs. H. C. Stephenson, E. P. Leonard, Frank McBride, R. H. Spaulding, H. F. Wilder, and W. C. Glenney. The panel on cattle diseases was composed of Drs. M. G. Fincher, H. K. Fuller, R. T. Gilyard, J. L. McAuliff, A. H. Russell, Richard Sears, and David Walker.

Motion pictures shown were: "Pharmacology of Respiratory Stimulants" (Ciba Pharmaceutical Products Co.); "The Influence of Tubal Factors on Sperm Transport in Vitro" (Dr. S. H. Sturgis, Massachusetts General Hospital, Boston); and "Equine Infectious Anemia" (U. S. BAI, Washington, D. C.).

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New York City's Narcotic Law.—The constitutionality of the New York City ordinance regulating the sale of barbiturates and other narcotics which went into effect Nov. 1, 1947, will be contested in the courts. The New York City Pharmaceutical Council has announced its intention to have the ordinance declared void on the ground that it is not consistent with the state's Sanitary Code.

Smallpox.—"The outbreak of smallpox in New York City in the early spring of 1947," says *Illinois Health Messenger*, "was prevented from spreading throughout the country by means of the greatest mass immunization program ever conducted by a nonmilitary population." The incident was a demonstration of the ever-present smallpox hazard and of the value of Jennerian vaccination.

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Twins Born to Aged Mare.—Although the odds against a mare giving birth to viable twins are about 100,000 to 1, the rare event did occur on the Trotwood Farm of Roger



—Courtesy of Parade

Una Woodford and her Twins.

Young at White Plains last spring. The dam is the 15-year-old saddle mare "Una Woodford," photographed with her lively offspring by press photographer Claude W. Huston of the syndicated magazine *Parade*. One of the foals is a chestnut colt and the other a bay filly. Another truth brought out in the report is that it's a million to one that twin foals will be of the same color and sex.

Ohio

State Association.—The Ohio State Veterinary Medical Association held its sixty-fourth annual meeting at the Deshler-Wallick Hotel, Columbus, on Jan. 7-9, 1948. The program follows:

Dr. C. D. Barrett, Akron: "Practical Treatments in Small Animal Practice."

Dr. L. K. Firth, Canton: "Interesting Experiences in Small Animal Practice."

Dr. A. R. Theobald, Cincinnati: "Peri-anal Abscesses and Anal Sac Removal."

A panel discussion on "Respiratory Coughs in Dogs" includes "Pathology," Dr. C. R. Cole, Department of Veterinary Pathology, Ohio State University: "Symptoms with Clinical Interpretation," Dr. J. H. Knapp, Columbus; Dr. C. A. Pleuger, Cincinnati; and "Treatment," Dr. B. P. Merrick, Berlin Heights.

The motion picture "Equine Infectious Anemia" was presented by the BAI, Washington, D. C.

Mr. Arthur Lejwa, Gould Research Foundation: "Fundamentals of Nutrition."

Dr. M. G. Fincher, Department of Medicine, Obstetrics and Ambulatory Clinic, New York State Veterinary College, Cornell University: "Control Measures in Mastitis."

Dr. D. S. Bell, Ohio Agricultural Experiment Station, BAI, Wooster; "Studies on Infant Mortality in Lambs."

A panel discussion of swine diseases was presented by Drs. A. H. Quinn, Jensen-Salsbery Laboratories, Inc., Kansas City, Mo., moderator; J. D. Ray, Omaha, Neb.; H. E. Pinkerton, Fort Dodge, Iowa; L. E. Willey, Sioux City, Iowa; R. E. Headley, Oxford; M. C. Stewart, Wren.

Dr. W. A. Hagan, president, American Veterinary Medical Association: "News from the American Veterinary Medical Association" and "Virus Diseases in Animals."

Dr. M. G. Fincher, New York State Veterinary College, Cornell University: "Sterility Problems in the Dairy Cow."

Dr. W. G. Venzke, Department of Preventive Medicine, College of Veterinary Medicine, Ohio State University: "Differentiation Between Infection and Vaccinal titers in *Brucella abortus* in Cattle."

The ladies were entertained at a social tea, luncheon, social hour, and at the annual banquet and dance held in the ballroom of the hotel. s/F. J. KINGMA, *Secretary*.

Pennsylvania

Annual Conference.—The School of Veterinary Medicine, University of Pennsylvania, held its forty-eighth annual conference on Jan. 6-7, 1948, at the University Museum. After the welcome address by Dr. Raymond A. Kelser, dean of the School of Veterinary Medicine, the program was presented.

Dr. G. H. Hopson, consulting veterinarian and milk sanitarian, De Laval Separator Company: "Veterinary Extension in Disease Control."

Dr. Karl Beyer, director of pharmacological research, Sharp & Dohme Laboratories, Glenolden, Pa.: "The Enhancement of Penicillin Blood Levels with the Aid of Caronamide."

Dr. F. Harold McCutcheon, School of Veterinary Medicine, University of Pennsylvania: "Intravascular Agglutination," with motion pictures.

"The Golden Gate in '48"

Dr. W. A. Hagan, president of the American Veterinary Medical Association and dean of the New York State Veterinary College: "Progress in Veterinary Education."

Dr. Erwin Jungherr, pathologist, Storrs Agricultural Experiment Station, University of Connecticut: "Differential Diagnosis of Respiratory Diseases of Poultry."

The Hon. George W. Gillie, U. S. House of Representatives, Washington, D. C.: "The Foot-and-Mouth Disease Outbreak in Mexico."

Dr. M. R. Clarkson, chief, Inspection and Quarantine Division, BAI, Washington, D. C.: "Developments in the Foot-and-Mouth Disease Situation in Mexico."

Dr. Gilles de Kock, deputy director, Veterinary Services, Union of South Africa, Pretoria: "Certain Problems of Nutrition."

Dr. Gerry B. Schnelle, assistant chief of staff, Angell Memorial Animal Hospital: "X-Ray Diagnosis in Small Animal Practice."

Dr. John D. Beck, School of Veterinary Medicine, University of Pennsylvania: "X-Disease," with motion pictures.

A panel discussion on "Immunization Against Canine Distemper" by Drs. Joseph B. Engle, Summit, N. J.; Otto Stader, Ardmore, Pa.; Gerry B. Schnelle of Angell Memorial Hospital; and James H. Mark, School of Veterinary Medicine, University of Pennsylvania. Dr. Raymond A. Kelser acted as moderator.

Dr. C. D. Stein, Pathological Division, BAI, Washington, D. C.: "Equine Infectious Anemia with Special Reference to the Recent Outbreak in New England," with motion pictures.

Dr. C. P. Bishop, director, BAI, Harrisburg, Pa.: "Our Veterinary Service."

Dr. George L. Graham, School of Veterinary Medicine, University of Pennsylvania: "Newer Knowledge in Helminthology."

A conference dinner, sponsored by the Veterinary Alumni Society, at which the ladies were entertained was held at McCallisters.

S/RAYMOND C. SNYDER, *Secretary.*

Texas

West Central Association.—Fifteen veterinarians from the west central portion of Texas met in Brownwood on November 10 to form a local organization, which will meet in March, August, and November. The officers are Dr. J. N. Chastain, Brownwood, *president;* Dr. J. R. Saunders, San Saba, *vice-president;* and Dr. C. B. Chastain, Brownwood, *secretary-treasurer.*

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Dean Appointed.—The Board of Directors at Texas A. & M. College announced, on December 26, the appointment of Dr. R. C. Dunn (OSU '11) to the deanship of the School of Veterinary Medicine at College Station. Dr. Dunn is head professor of veterinary pathology and bacteriology at the college.

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Dr. Dutro's Border Patrol Keeps Foot-and-Mouth Disease Watch.—A hard-riding, high-spirited group of men known as the Texas Range Riders, organized last summer, is maintaining a steady vigil against foot-and-mouth disease. Headed by Dr. N. E. Dutro (KCVC '10), of Brownsville, these men patrol the American bank of the Rio Grande from Brownsville to El Paso, a distance of over 800 miles, watching for stray animals and "wet backs," the latter being people who wade or swim across the river, usually for some illegal purpose.

According to Hal O'Flaherty (*Chicago Daily News*, Jan. 3, 1948), there are 51 paid riders, with 21 camps scattered along the river. Many of the men ride 18 to 20 miles a day, rain or shine. Their job is to inspect activity on the river twenty-four hours a day, rope and tie stray animals, and inspect all persons crossing from the Mexican side. Final inspection of animals is made by Dr. Dutro. Hides and raw meat are confiscated and burned, even if the meat happens to be carried in the form of a roast beef sandwich. Recently, a Texan who tried to smuggle a deer hide from Mexico was caught and held for legal action.

"Plenty of evidence exists here that this state and the federal government are doing everything possible to prevent the disease from crossing the border," O'Flaherty declared.

Utah

Intermountain Association.— The twentieth annual meeting of the Intermountain Veterinary Medical Association was held at the Newhouse Hotel, Salt Lake City, on Jan. 12-14, 1948. Mayor Earl J. Glade of Salt Lake City welcomed the guests; Dr. John I. Curtis, Utah state veterinarian, responded; and President K. K. Schott of Buhl addressed the Association. The scientific program continued as follows:

Dr. R. C. Klussendorf, assistant executive secretary, AVMA, Chicago, Ill.: "Bovine Mastitis" and "Productive Disorders in Dairy Cattle."

Dr. E. R. Frank, head, Department of Surgery, Kansas State College, Manhattan: "Bovine Surgery," "Equine Surgery," and "Equine Lameness."

Dr. S. E. Phillips, Medford, Ore.: "Diseases of Digestive Tract of Dogs" and "Diseases of the Urinary Tract in Dogs."

Dr. A. K. Kuttler, in charge, Tuberculosis Eradication Division, U.S. BAI: "Recent Developments for More Uniform Procedures in Brucellosis and Tuberculosis Eradication."

Dr. Nick Klaich, field veterinarian, Nevada Department of Agriculture, Reno: "Cattle Scabies and Recent Outbreaks in California, Oregon, and Nevada."

Dr. Lee Seghetti, Veterinary Research Laboratory, Montana State College, Bozeman: "Sheep Diseases."

Dr. G. H. Good, Wyoming state veterinarian, Cheyenne: "Interstate Regulations."

Dr. James H. Steele, chief, Veterinary Public Health Division, U. S. Public Health Service, Washington, D. C.: "A Veterinary Public Health Service."

Dr. M. L. Miner, Veterinary Science Department, Utah State Agricultural College, Logan: "Staphylococcus in Turkeys."

Dr. Heinz Siedentopf, director, Veterinary Biological Products, Fromm Laboratories, Grafton, Wis.: "A Diesease Resembling Canine Distemper."

Dr. T. W. Myer, veterinarian in charge, U. S. BAI, Boise, Idaho: "Brucellosis and Tuberculosis in Public Health."

Dr. O. H. Jacobsen, chief, State Meat Inspection Division, Salt Lake City: "Frozen Food Lockers."

Dr. E. A. Tugaw, Ogden: "Practicing Veterinarians and Public Health."

Dr. W. W. Smith, head, Department of Bacteriology and Public Health, Utah State Agricultural College, Logan: "Human Food Poisoning of Animal Origin."

An informal group discussion dealt with three phases of veterinary work: practitioners, Dr. Phil H. Graves, Idaho Falls, chairman; regulatory workers, Dr. Edgar Heiny, veterinarian in charge, U. S. BAI, Denver Colo., chairman; and research workers, Dr. A. M. Lee, head, Department of Veterinary Science, University of Wyoming, Laramie, chairman.

A panel discussion, "Relationship of Veterinary Medicine to Public Health," was conducted by Dr. H. G. Stoenner, public health veterinarian, Salt Lake City.

Dr. Glenn C. Holm, vice-director, Agricultural Experiment Station, University of Idaho, Moscow, was the chairman of a "Question Box" on varied subjects of the program.

The AVMA films, "Brucellosis in Swine" and "Swine Surgery," were shown by Dr. L. M. Hutchings of Purdue University, Lafayette, Ind.; "Newcastle Disease" was shown by Dr. P. P. Levine, New York State Veterinary College, Ithaca. A film on "Swine Erysipelas" was presented through the courtesy of the U. S. BAI.; and DuPont & Co. presented a film, "Report on DDT."

The ladies auxiliary was entertained at a birthday luncheon, a get-acquainted party, a breakfast, and bridge and tea and enjoyed the banquet with their husbands.

s/M. L. MINER, *Secretary.*

Wisconsin

State Association.—The thirty-third annual meeting of the Wisconsin Veterinary Medical Association was held at the Park Hotel in Madison on Jan. 6-7, 1947. The featured speakers included:

Dr. James Farquharson, Colorado State College, Fort Collins: "Surgical Techniques."

Dr. M. G. Fincher, New York State Veterinary College, Ithaca: "Mastitis Control."

Drs. J. V. LaCroix, Evanston, Ill.; F. W. Milke, Menominee Falls; C. W. Anderson, Milwaukee; C. M. Heth, LaCrosse; G. J. Marold, Milwaukee; and P. T. Candlin, Madison: Panel Discussion, "Diseases of Small Animals."

Drs. C. A. Brandly and R. P. Hanson, University of Wisconsin, Madison: "Poultry Diseases."

Dr. Ralph West, St. Paul, Minn.: "Brucellosis Control."

Drs. J. T. Schwab and W. R. Winner, Madison: "Regulatory Aspects of the Disease Control Situation."

Drs. J. T. Schwab, Madison; W. W. Arzberger, Watertown; T. H. Ferguson, Lake Geneva; George Gettleman, Hartford; and B. B. Morgan, Madison: Panel Discussion, "Postparturient Problems in Dairy Cattle."

Mr. Arlye Mucks was the toastmaster at the banquet; Dr. J. S. Healy was an honorary toastmaster; and songs by Virginia Cooper were presented. Mr. A. J. Glover, editor of *Hoard's Dairyman*, Fort Atkinson, spoke on "The Veterinarian and Livestock Health."

The ladies auxiliary was entertained at a matinee and at luncheon and cards at the Park Hotel.

s/B. A. BEACH, *Secretary.*

• • •

Triplet Guernsey Calves.—On Oct. 10, 1947, a Guernsey cow owned by Henry Feldbruegge, Mayville, Wis., gave birth to triplet bull calves. The total weight of the calves was 209 lb., the individual weights being 76, 70, and 63 lb.



Triplet calves and owner, Henry Feldbruegge.

The delivery was normal except for retained placentae which Dr. J. M. Hicks, attending veterinarian, removed.

The Guernsey, now 9 years old, had five successive sets of twins previous to the birth of the triplets. She has never given birth to a single calf.

FOREIGN

Great Britain

Dog Census and Rations.—There are approximately 3,300,000 dogs in England, Scotland, and Wales (population 40,000,000), about 1 dog for every four families. Dog owners experience considerable difficulty in obtaining food for their dogs. Other animals are rationed but not dogs.—*Dog World, December, 1947.*

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Black Marketing.—Police searching the woods near Aylesbury, Buckinghamshire, found a secret abattoir where the carcass of a cow and a number of hides were stored. The hunt is being continued for other illegal slaughtering places—in an effort to track down gangs believed to be supplying the black market with pork and beef.—*Vet. Rec., 59, Nov. 22, 1947.*

Italy

Congress on Animal Reproduction.—The date of the First International Congress of Physiology and Pathology of Animal Reproduction and of Artificial Insemination is to be held at Milan, Italy, June 23-30, 1948. This will allow participants to attend the International Congress of Genetics in Stockholm, July 7-14, and the International Congress of Zoölogy in Paris, July 21-27. A number of universities and academies from North and South America, various European countries, Africa, and Oceania plan to send representatives to the Congress.

Among subjects to be presented are: biologic and pathologic problems of reproduction, breeding problems, methodologic and practical problems of artificial insemination, and legislative and organization problems of artificial insemination and animal reproduction.

STATE BOARD EXAMINATIONS

Illinois—The Veterinary Examining Committee of the Illinois Department of Registration and Education will hold examinations Sept. 27-28, 1948, in Chicago, Ill. Applications should be filed with Mr. Fred W. Ruegg, superintendent of registration, Department of Registration and Education, Springfield. For additional information address Mr. Ruegg.

Ohio—The State Board of Veterinary Medical Examiners of Ohio will conduct examinations March 16-17, 1948 in the College of Veterinary Medicine, Ohio State University, Columbus. Applicants desirous of taking the examination should be present at 8 a.m. on the first day with their certificate of graduation and a photograph showing their head and shoulders. Examination fee is ten dollars. Inquiries should be directed to Dr. H. G. Geyer, chief, Division of Animal Industry, Ohio Department of Agriculture, Columbus.

COMING MEETINGS

Virginia Veterinary Medical Association. Richmond, Va., Feb. 2-4, 1948. W. L. Bendix, 1102 State Office Bldg., Richmond 19, Va., secretary.

Connecticut Veterinary Medical Association. Annual Meeting. Hotel Bond, Hartford, Conn., Feb. 4, 1948. E. H. Patchen, 289 New Haven Ave., Milford, Conn., secretary.

Kansas Veterinary Medical Association, Topeka, Kan., Feb. 5-6, 1948. C. W. Bower, 3119 Stafford St., Topeka, Kan., secretary.

Veterinary Medical Association of New Jersey. Annual meeting. Hotel Hildebrecht, Trenton, N. J., Feb. 5-6, 1948. J. R. Porteus, P.O. Box, 938, Trenton, N. J., secretary.

Midwest Feed Manufacturers' Association. Kansas City, Mo., Feb. 19-20, 1948. J. D. Dean, Midwest Feed Manufacturers' Association, 20 W. 9th St. Bldg., Kansas City 6, Mo.

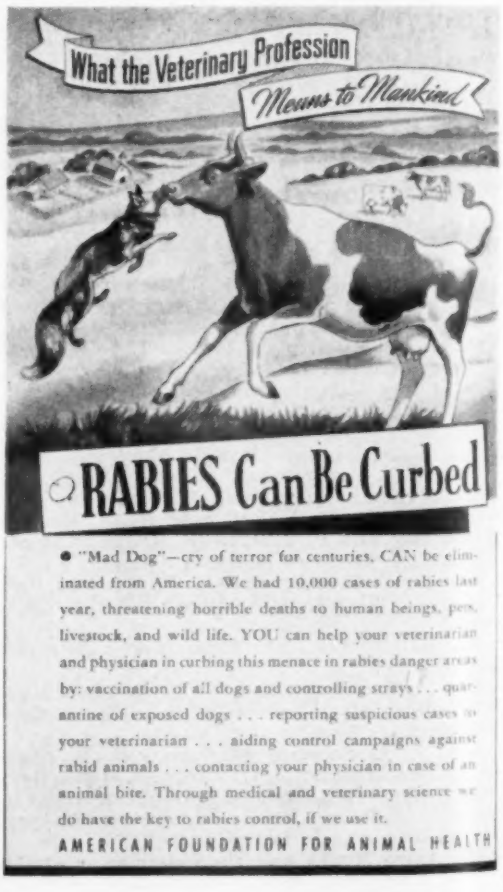
Tennessee Veterinary Medical Association. Annual meeting. Hotel Andrew Johnson, Knoxville, Tenn., April 5-6, 1948. H. W. Nance, Lawrenceburg, Tenn., secretary-treasurer.

American Animal Hospital Association. Hotel Atlanta Biltmore, Atlanta, Ga., April 20-22, 1948. R. E. Ruggles, P.O. Box 303, Moline, Ill., secretary.

American Dairy Science Association. University of Georgia, Athens, Ga., June 14-16, 1948. R. B. Stoltz, Ohio State University, Columbus 10, Ohio, secretary.

North Dakota Veterinary Medical Association. Hotel Clarence Parker, Minot, N. Dak., June 14-15, 1948. F. M. Bolin, North Dakota Agricultural College, College Station, Fargo, N. Dak., secretary.

Kentucky Veterinary Medical Association. Louisville, Ky., July 14-15, 1948. T. P. Strittmatter, Jr., 1034 Monmouth St., Newport, Ky., secretary-treasurer.



American Veterinary Medical Association. Palace Hotel, San Francisco, Calif., Aug. 16-19, 1948. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

American Association for the Advancement of Science. Centennial Meeting, Washington, D. C., Sept. 13-17, 1948. J. M. Hutzel, 1515 Massachusetts Ave., N.W., Washington 5, D. C., assistant administrative secretary.

Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Houston Veterinary Medical Association, Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Saint Louis District Meetings. Roosevelt Hotel, St. Louis, Mo., the first Friday of February, April, June and November, W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

VETERINARY MILITARY SERVICE

Veterinary Activities, Army Medical Center

Colonel Raymond Randall, V.C., chief of the Veterinary Division, Army Medical Department Research and Graduate School, Army Medical Center, now recovering in Walter Reed General Hospital from a recent operation, will again spearhead research being conducted by the veterinarians in the field of viruses and foods of animal origin.

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Results of the school's experiments on frozen homogenized milk carried on since 1946 have been published in the *Journal of Dairy Science*. Progress in this project has advanced to the stage where it will soon be possible to supply good fresh frozen milk to troops wherever they may be stationed.

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Lt. Colonel R. H. Yager, V.C., recently replaced Major Fred D. Maurer, who is now taking a course of study in virus diseases at the Rockefeller Institute in New York City, as chief of the Biological Section and assistant chief of the Veterinary Laboratories.

Captain Manuel C. Kastner, recently home from a three-and-a-half-year tour of duty in the European Command, and originally from Wisconsin, is the new officer in charge of the School's Small Animal Section, having replaced Lt. Howard Slider who has retired to civilian life at Hampton, Va.

BIRTHS

Dr. (Ont. '33, G) and Mrs. V. K. Jensen, 202 Washington Ave., Montevideo, Minn., have adopted a daughter, Becky Ann, born May 13, 1947.

To Dr. (KSC '47) and Mrs. Otto F. Luke, Lebanon, Kansas, a daughter, Andrea, Sept. 7, 1947.

To Major (KSC '39) and Mrs. William H. Dieterich, VC, College of Veterinary Medicine, Seoul National University, Seoul, Korea, a son, Christopher Hyde, Nov. 3, 1947.

To Dr. (Wash. '36) and Mrs. Fleetwood R. Koutz, 1574 Wyandotte Road, Columbus, Ohio, a son, Dec. 10, 1947.

To Major (API '43) and Mrs. William D. Nettles, V.C., Camp Lee, Va., a daughter, Jenny Rhea, Jan. 4, 1948.

MARRIAGES

Dr. Robert P. Wagers (OSU '36), 4204 Colonial Rd., Pikesville 8, Maryland, to Miss Jean M. McComas, August 9, 1947.

DEATHS

Frederick W. Ashe (CVC '90), Brooklyn, N. Y., died late in 1947. He was a well-known racing official and an authority on horses.

★**Frank M. Baldwin** (KCVC '07), 72, Horton, Kan., died at his home Oct. 31, 1947, of a heart attack. In 1915 Dr. Baldwin was president of the Kansas Veterinary Medical Association and was also affiliated with the North East Kansas Veterinary Medical Association. He remained active in annual conventions and district meetings throughout his life. He was admitted to the AVMA in 1944.

★**Robert A. Bateman** (KCVC '10), 66, Cheyenne, Wyo., died July 3, 1947, after an illness of two years. He was affiliated with the Wyoming Veterinary Medical Association after his graduation from the Kansas City Veterinary College in 1910. He was admitted to the AVMA in 1944.

James D. Bennehoff (CORN '27), Alfred, N. Y., died during the last week in October, 1947. Dr. Bennehoff was instructor in biology and zoölogy at Alfred for seventeen years before studying for his D.V.M. degree at Cornell University. He was with the New York State BAI until recently when he retired to a small animal hospital.

★Indicates members of the AVMA.

★**John T. Billingsley** (API '40), 30, Bristol, Va., was killed in a plane crash in the vicinity of Lalmanirht, India, Aug. 5, 1945. He was a member of the Omega Tau Sigma fraternity and was admitted to the AVMA in 1940.

Bartholomew Buchli (ISC), 85, Alma, Kan., died on Oct. 22, 1947, at his home. Dr. Buchli was born in Versam, Switzerland, and came to the United States in 1869 when he was seven years old. After he had received the degree of Doctor of Veterinary Medicine from Iowa State College, he taught for ten years in the Wabaunsee County schools.

Fred G. Cook (WEST '05), 85, Paris, Texas, died Nov. 14, 1947. He was holder of the second oldest veterinarian's license in Texas and had been for thirty years city inspector for Paris. Dr. Cook, who was born in Stuttgard, Germany, and came to the United States in 1872, had been in poor health for some time preceding his death.

★**Pvt. Joseph Allan Graham** (ISC '42), 25, Milo, Iowa, was reported missing in action on Oct. 10, 1944. He received the degree of D.V.M. from Iowa State College in 1942 and was admitted to the AVMA in the same year.

Orestes U. Lash (KCVC '10), 75, Moberly, Mo., died at St. Lukes Hospital, in Kansas City on Oct. 29, 1947, after an illness of three months. Dr. Lash had been engaged in small animal practice.

★**L. E. McDonell** (CVC '08), Sierra Madre, Calif., died on July 5, 1947. He had practiced at Detroit Lakes, Minn., until 1941 at which time he moved to California.

Vivian W. Melvin (CIN '15), Toledo, Ohio, died on Aug. 19, 1947. He had retired from the veterinary staff of the Toledo Health Department in June because of poor health.

★**Capt. C. H. Mickelsen** (WASH '39), 34, Glendale, Calif., died at Fukuoka Camp in Japan, Feb. 4, 1945, where he was being held as a prisoner of war. He had been admitted to the AVMA in 1941.

★**Major Donald R. Morgan** (WASH '30), 39, Olympia, Wash., has been reported killed while being transported from the Philippine Islands to Japan Dec. 4, 1944. He was admitted to the AVMA in 1937. At the time of his death he had been stationed with the Army Veterinary Corps on Manila, P. I.

★**Robert E. Mosedale** (RCVS '06), 69, Bernardsville, N. J., died on Dec. 21, 1947. Dr. Mosedale was born in London, England, and received his M.R.C.V.S. degree from the Royal College of Veterinary Surgeons. He was admitted to the AVMA in 1920.

George M. Potter (OSU '06), Portland, Maine, died during the latter part of 1947. He had been in poor health for a year preceding his death.

J. E. Pyle (CVC '07), Toulon, Ill., died on Oct. 16, 1947. Dr Pyle had practiced in Toulon for thirty-five years and had retired just a short time before his death.

★**Clarence W. Sass** (MC K '20), 50, Toledo, Ohio, died Oct. 3, 1947. After his graduation from McKillip Veterinary College in 1920, he was affiliated with Northwestern Ohio Veterinary Medical Association. He had been an AVMA member since 1928.

★**Lt. Col. Frank B. Steinkolk** (CIN '17), Washington, D. C., has been reported deceased by the Office of the Surgeon General. He was admitted to the AVMA in 1920.

★**Joe G. Turner** (TEX '38), 29, Marfa, Texas, was reported missing in action in the Philippine Islands, Feb. 14, 1945. He was a member of the Texas Veterinary Medical Association and was a first lieutenant in the veterinary reserve. He was admitted to the AVMA in 1940.

★**Russell E. Whitcomb** (GA '31), 41, Belfast, Maine, died suddenly on May 23, 1947. Coronary thrombosis was the cause of death. Dr. Whitcomb was admitted to AVMA membership in 1935.

Correction

The address of the late Dr. Walter J. Crocker at the time of his death (Dec. JOURNAL, p. 542) should have been Philadelphia, Penn., instead of Fort Worth, Texas. Dr. Crocker did live in Fort Worth several years ago, but was later professor of pathology and bacteriology at the University of Pennsylvania, School of Veterinary Medicine, and after that was for twenty-one years principal clinical pathologist at the Philadelphia General Hospital.

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Chicago, Illinois

ABLE-BODIED young men from 25 to 35 years old, without college training, some of whom have not even finished high school, have taken the twelve-week intensive courses in horseshoeing given at Michigan State College in 1946 and 1947. These men are now making from $25 to $40 a day as travelling horseshoers and have more than they can do.

Their course of training was short but rigorous. They worked in the blacksmith shop eight hours a day, five and a half days a week. Their training included the anatomy of the cannon, fetlock, pastern, and foot; dissection of actual specimens obtained from horse-killing plants,—500 of these were used each twelve weeks, or 50 for each student. Besides studying the anatomical structures, the students trimmed such feet, nailed shoes on the specimens and became thoroughly familiar with where, how, and why the foot was trimmed, shoes fitted, and nails driven.

Making shoes from bar iron, adapting factory-made shoes to fit precisely on the hoof, putting on calks, and learning how to use the oxyacetylene torch in welding were taught, and the men were given much practice at the forge and on the anvil.

Actual shoeing of live horses followed, under the critical observation of the master horseshoer, John MacAllan. He is one of America's most famous farriers. The other students stood by, watching and learning by observation and from comments of MacAllan. They, in turn, shod live horses, and each tried to do a better job than the preceding fellow. They learned by lecture, ob-

(*Continued on page 24*)

Executive secretary of the Horse and Mule Association of America, Inc., Chicago, Ill.



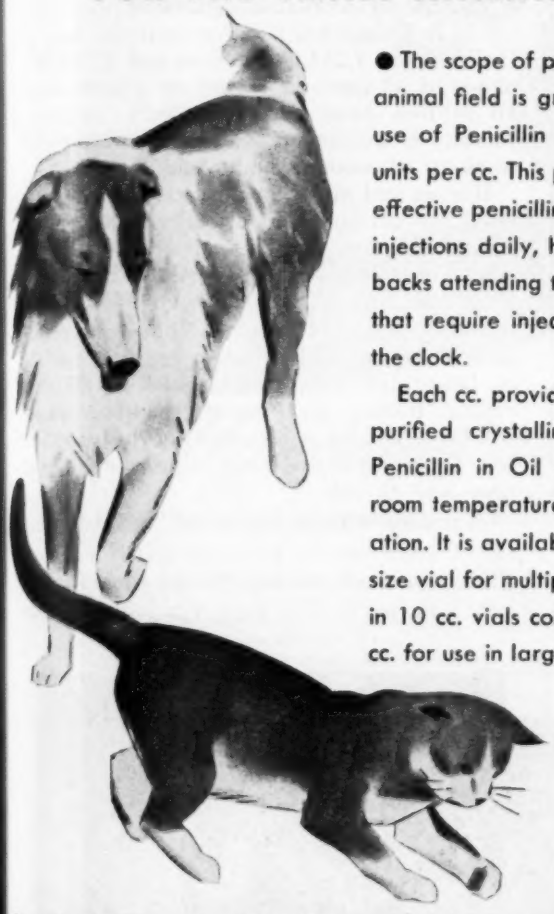
—*Horse and Mule Association*

Students at Michigan State College, who took the short course (12 weeks) in farriery early in 1947 under Blacksmith John MacAllan of the college. The students (right to left) are: Al Guttstein, Frank Backes, Adolph Paulasky, Roy Hamil, Fred Coates, Bill McCalla, and Al Bradish.

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servation, and actual doing of the job. George Stevenson, another famous master horseshoer, who judged a horse shod by each student near the end of the course, was astonished at the excellent work done by men who had up to then received but ten weeks of training. The graduates know how to do a good job of shoeing and will improve in speed as they work, for practice makes perfect and increases skill.

There are a great many horses and mules to shoe. In many places, there are not enough farriers to do the work that needs to be done. Competent farriers, well trained, who can do first class work are in strong demand and are earning from $25 to $50 per day—some even more.

The latest available estimates made by the U. S. Department of Agriculture, Jan. 1, 1947, report 7,251,000 horses and 2,773,000 mules of all ages on farms, or a little over 10 million head in agriculture. Approximately 8 million of these are suitable for work in harness or under saddle.

Horses and mules in nonagricultural pursuits are estimated by the Horse and Mule Association of America, Inc., at 450,000 head, virtually all of which are at work in mines, lumber camps, on streets of cities, towns, and villages, in riding academies, or on race tracks. Horses racing or being trained aggregate about 25,000; riding horses used under saddle, about 850,000. Riding is increasing but buyers are becoming more particular about what they buy to ride.

A trailer with forge, anvil, and complete set of tools can be put together for about $200. One of these, drawn behind his car, will serve the new graduate in his

(*Continued on page 26*)



—*Horse and Mule Association*

The Michigan State College students in farriery, who took part in a contest with colts which they fitted, trained, and shod.



SELECTIVE CHEMOTHERAPY

Hypodermically and Orally

For antibacterial chemotherapy there are available a number of sulfonamide compounds.

Everyday Streptococcus Infections **. . . Owing to its relatively good tolerance, Neoprontosil is of particular value in many streptococcus infections which are encountered in everyday veterinary practice, including septicemia, strangles, metritis, mastitis, distemper and meningitis. Relatively small doses have yielded very good results.**

Write for booklet which contains detailed discussion of indications, dosage, manner of use, and side effects.

NEOPRONTOSIL

Trademark reg. U.S. Pat. Off. & Canada

***Brand of* AZOSULFAMIDE**

Disodium 4-sulfamidophenyl-2-azo-7-acetylamino-1-hydroxynaphthalene 3,6-disulfonate

HOW SUPPLIED

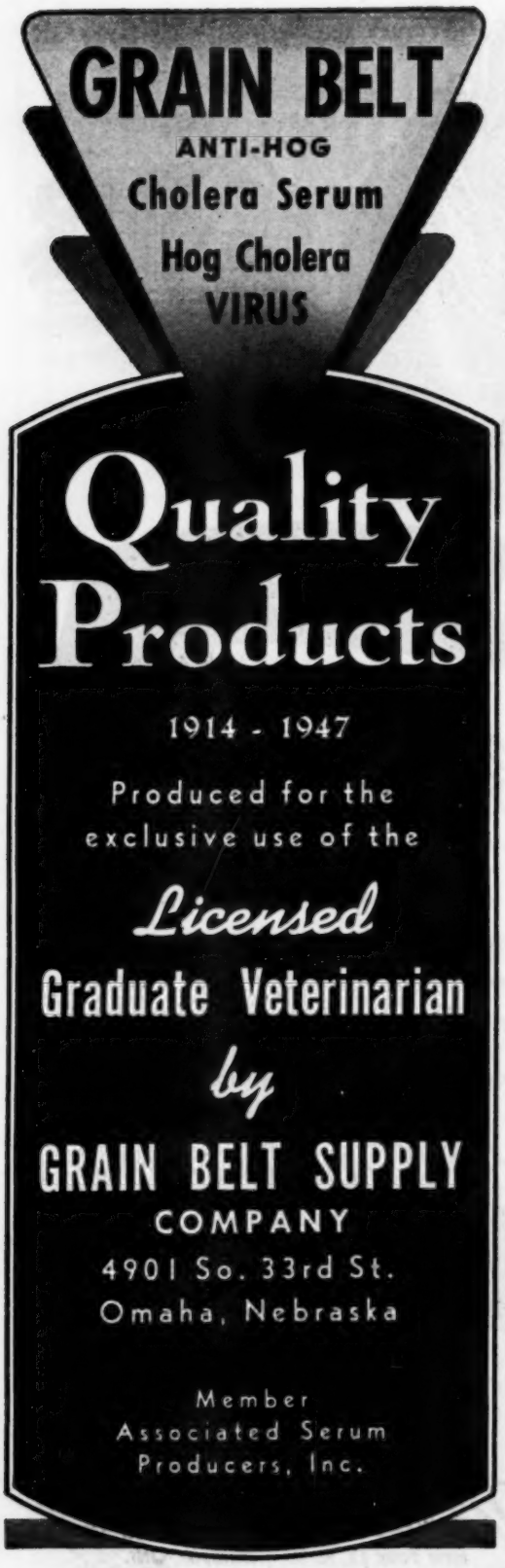
For Oral Administration: Neoprontosil tablets of 5 grains, bottles of 50, 500 and 5000. (Caution: Not to be used for injection.) Neoprontosil capsules of 3 grains, bottles of 50 and 500. (Caution: Not to be used for injection.)

For Parenteral Administration: Neoprontosil 5 per cent solution, bottles of 125 cc. with rubber diaphragm stopper.

The businesses formerly conducted by Winthrop Chemical Company, Inc. and Frederick Stearns & Company are now owned by Winthrop-Stearns Inc.

Winthrop-Stearns INC.

NEW YORK 13, N. Y. WINDSOR, ONT.



work as a travelling horseshoer until his earnings justify a more pretentious trailer or truck.

The Horse and Mule Association of America, Inc., started the course at Michigan State College in January, 1946, by persuading the college authorities to undertake it, and by furnishing $1,500 in cash, awarded as scholarships—$150 to each man taking the course—to help pay expenses and tuition. Only seven men enrolled in the first course, but they did so well that a great many more applied for the second course—January to April, 1947—than could be accommodated. The Michigan State College authorities advise that they now have more than 100 applications on file and can accept but ten in January, 1948.

Negotiations are now in progress with Cornell University, Ithaca, N. Y., Rutgers University, New Brunswick, N. J., and California Polytechnic School, San Luis Obispo, Calif., for similar schools in horseshoeing. The same offer has been made at each school—to wit, $1,500 in scholarships or $150 to each student taking the course. The authorities in charge have not yet decided whether they can find space and instructors for such a twelve-week course beginning in January, 1948, but horsemen hope that the decision will be favorable.

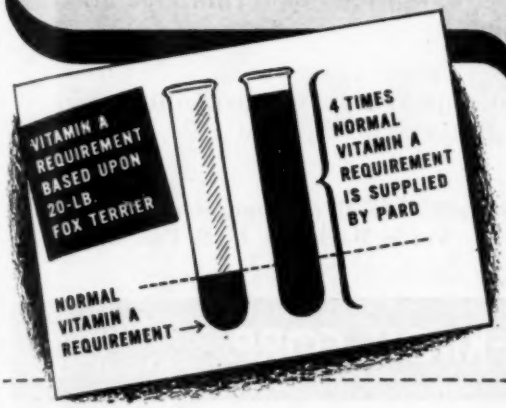
Veterans are given preference and are also entitled to financial aid as GI's—$65 a month to single and $90 a month to married men. This, with the scholarships, will more than pay all expenses.

There may be other lines of work in which men without college training can take a twelve-week intensive course of training and with very little invested can at once begin earning $500 a month or more, but we do not know of them. In fact, one veterinarian of long experience recently remarked, "That is more money than most young veterinarians make for the first few years—even after five years of educational training costing at least $6,000 and five years' time."

Common shoeing of farm horses or riding-school horses is now $5.00 per head; special shoes for show horses, either light or draft, are from $6.00 to $12.00 per animal; fancy Scotch bottom shoes on draft stallions up to $15.00. Race horses, Thoroughbred or Standard Bred, range from $7.00 to $9.00 per head, and occasionally

(Continued on page 28)

Actual tests show Pard supplies many times the Vitamin A requirements for dogs and optimum Vitamin D



The chart on the left shows the amount of Vitamin A required to maintain optimum dog health in a 20-lb. Wire-Haired Fox Terrier. It demonstrates the abundancy of A in Pard, which also contains the Vitamin D in required proportions.

VITAMIN A CONTENT OF PARD

Based on the requirements of a 20-lb. Wire-Haired Fox Terrier.

VITAMIN A—Pard supplied up to 4 times the normal requirement.

VITAMIN D—Pard supplied this important vitamin in optimum amounts.

Vitamin A is essential in the diet for normal vitality of epithelial cells and also aids greatly in maintaining resistance to infections. It is also of value in the maintenance of normal eye functions and mucous membranes.

Vitamin D plays an important part in helping to regulate metabolism of calcium and phosphorus for use in bone and tooth structure and normal growth.

Laboratory Kennel studies are just another step by Swift & Company to assure dogs better health through better foods. Careful quality-supervision is maintained in its manufacture to guarantee uniformity in nutrient content, taste, color, odor and texture. Pard is an easy-to-feed nourishing food that dogs love from the very first sniff.



The Pard formula is rich and appetizing and includes wholesome foods dogs need . . . a well-balanced formula, rigidly adhered to and nutritionally excellent. Pard contains every known essential for good nutritional health.



Metrazol

In Small Animal Practice
Council Accepted

STIMULATES medullary and cortical centers.

COMBATS respiratory and circulatory failure, drug depression, collapse and shock from operation or accident.

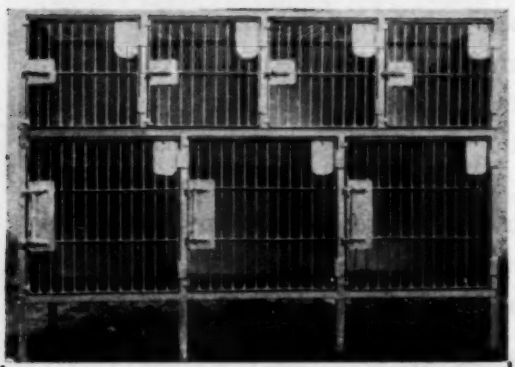
OVERCOMES anesthetic emergencies, lightens or terminates anesthesia, specifically barbiturate.

DOSE—1 cc. Metrazol, by injection, repeated as needed to maintain recovery. In 1 cc. ampules and in 30 cc. vials.



Metrazol (brand of pentamethylentetrazol), Trade Mark reg. U. S. Pat. Off.

BILHUBER-KNOLL CORP. ORANGE NEW JERSEY.



RIVERSIDE KENNELS — QUALITY FIRST

Dimensions of standard unit shown above. Overall length 7 feet. Upper tier (4) 21 x 30 inches. Lower tier (3) 28 x 30 inches. Minor changes in design at no extra cost. Casters if desired. Foolproof latches and identification tags, on heavy steel barred doors. Bottom cages have 5-inch ventilating strip.

Prices of above unit:

10 or more .....$237.50 each
3 to 10 units .....$250.00 each
Single unit $275.00
F.O.B. Riverside, California.

5 compartment units.....$160.00 each

A lifetime of service and guaranteed by one of California's oldest iron works.

RIVERSIDE IRON WORKS

5422 Mission Blvd. Riverside, California

when platers are scarce, a trainer has to pay more. However, no farrier—no matter how skillful he may be—can shoe a race horse on any recognized course unless he is a member of the platers' union, admission to which is difficult to obtain.

The strength and usefulness of veterinary medicine lies in application of scientific principles more than in new discoveries unscientifically employed.

The first seeds of veterinary education in the U.S.A. were planted by far-seeing Boston veterinary practitioners throughout the eighteen-fifties. They founded a veterinary college and a monthly journal, neither of which were able to survive the tragic events of the Civil War.

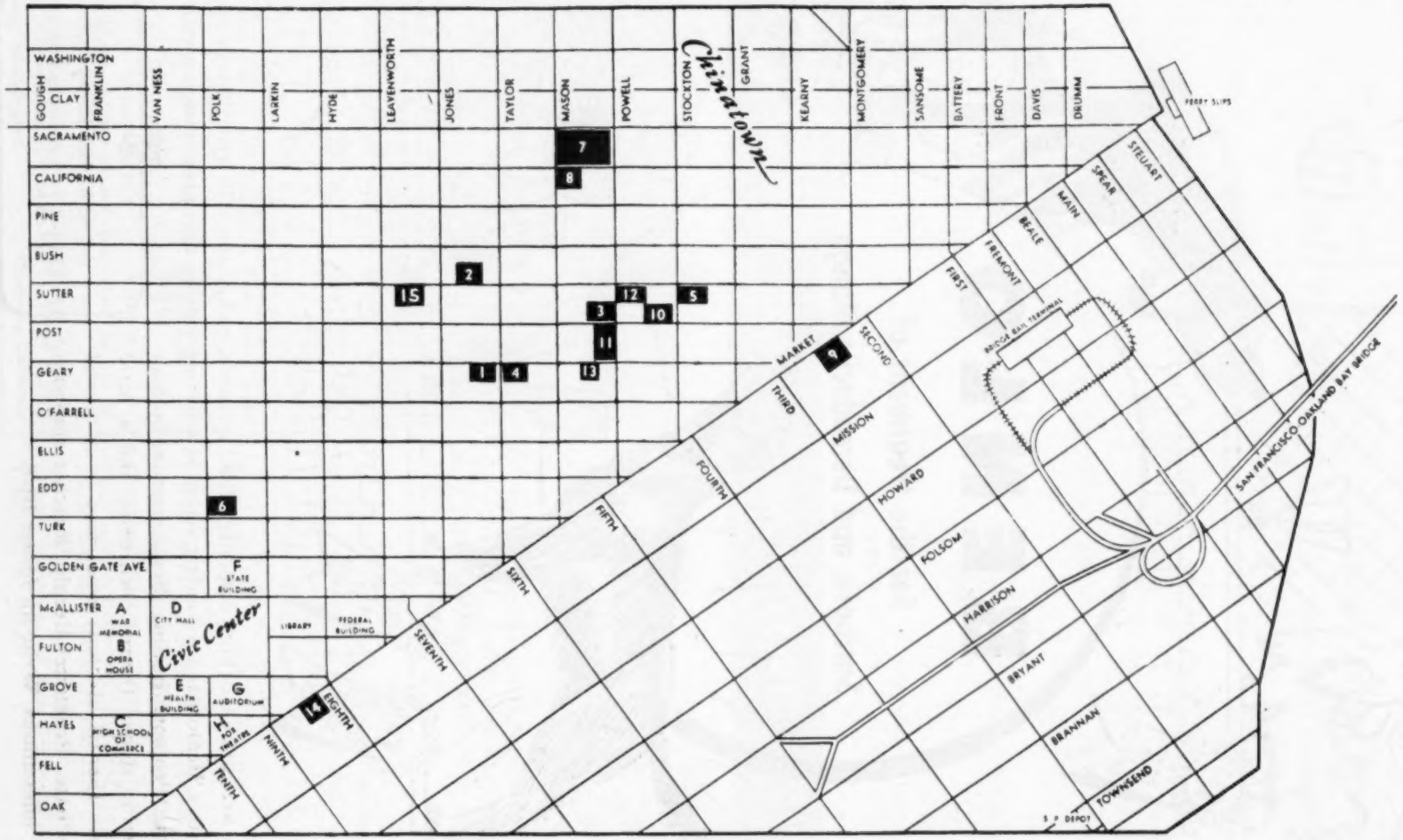
The First Lecture on Veterinary Medicine.—Speaking, of course, of the U.S.A., the first lecture on veterinary science on record was delivered in 1852 before the Massachusetts Society for the Promotion of Agriculture by D. D. Slade, M.D., one of the founders of the Boston Veterinary Institute in 1854.



Effective in treatment of both demodectic and sarcoptic mange and skin irritations caused by parasites. Benlo has a secondary action in relieving itching thus preventing excessive scratching. Promotes healing. Benlo contains both an antiparasitic agent (benzyl benzoate) and a local anesthetic (benzyl alcohol) emulsified in a neutral aqueous base. Penetrates deeply. Reaches stubborn chronic infestations. Write for folder BJ-8.

R. J. STRASENBURGH Co.
PHARMACEUTICAL CHEMISTS SINCE 1888
ROCHESTER 4, NEW YORK

Street Plan of Downtown San Francisco Showing Location of Hotels for AVMA Convention Housing



KEY TO HOTELS

1. Bellevue
2. Canterbury
3. Chancellor
4. Clift
5. Drake-Wiltshire
6. Embassy
7. Fairmont
8. Mark Hopkins
9. Palace
10. Plaza
11. St. Francis
12. Sir Francis Drake
13. Stewart
14. Whitcomb
15. Commodore

HOTEL RESERVATIONS—SAN FRANCISCO SESSION

Eighty-fifth Annual Meeting, American Veterinary Medical Association

Aug. 16-19, 1948

A Housing Bureau has been organized for the San Francisco session. All requests for rooms will be handled in chronological order; therefore, send in your application as early as possible.

Use the form below and be sure to indicate your first, second, and third choice hotel. Because of the limited number of single rooms available, you will have a better chance of securing accommodations if request is for rooms to be occupied by two or more persons. Rates quoted are for the *room;* in case of double occupancy, the rate will be shared.

All requests must be accompanied by a deposit check for $5.00 per person or $10.00 per room, made out to "AVMA Housing Bureau." Due to crowded conditions, hotels cancel unclaimed reservations by 6:00 p.m. Therefore, to avoid any misunderstanding, the deposit holds the room on your arrival day — whatever the hour. *Bring your confirmation slip or cancelled deposit check* as proof of reservation.

All reservations must be cleared through this Housing Bureau. All requests must give definite date and approximate hour of arrival and departure; also names and addresses of *all* persons who will occupy rooms. All reservations will be confirmed if request is received not later than Aug. 1, 1948.

Schedule of Hotel Rates—See Locations on Opposite Page

Hotel	Single	Double Bed	Twin Beds	Parlor Suite	2-Bedrm. Suite (Connecting Bath)
*Bellevue		$5.00	$6.00	$10.00	
*Canterbury		$4.00-$5.00	$4.50-$6.00		
Chancellor		$4.00	$4.50		
Clift		$6.00-$8.00	$7.00-$10.00	$12.00-$15.00	
Commodore			$5.50-$7.50		
*Drake-Wiltshire		$3.50-$4.00	$5.00		
*Embassy		$3.50-$4.00	$3.50-$4.00		
Fairmont			$6.00-$10.00	$18.00-$22.00	
Mark Hopkins	$7.00-$9.00		$10.00-$14.00	$20.00-$30.00	
Palace		$8.00-$11.00	$8.00-$11.00	$14.00-$20.00	
Plaza		$5.00-$6.00			
*St. Francis		$8.00-$10.00			$18.00
*Sir Francis Drake		$8.00-$10.00	$9.00-$12.00		
Stewart		$4.00-$4.50	$4.50-$5.00		$9.00
*Whitcomb		$6.00-$9.00	$7.00-$9.00	$12.00-$27.00	$11.00-$13.00

*Charge for each extra person in room, $1.00 to $2.00 per day.

---Cut Off Here---

HOTEL RESERVATION FORM

DR. NELSON E. CLEMENS, CHAIRMAN, AVMA HOUSING BUREAU
ROOM 200, CIVIC AUDITORIUM,
SAN FRANCISCO 2, CALIFORNIA

Date .....

Please make reservations noted below:

	Accommodations and Rate Desired	
First choice hotel.....	Single Room	Rate.....
	Double Room	Rate.....
Second choice hotel.....	Twin Bed Room.....	Rate.....
	Parlor Suite	Rate.....
Third choice hotel.....	2-Bedrm. suite (connect. bath)....	Rate.....

Arriving on .....**at**.....**a.m.**.....**p.m.**

Leaving on .....**at**.....**a.m.**.....**p.m.**

Room will be occupied by:

Name .....Address .....

Name .....Address .....

Name .....Address .....

My check for $.....is enclosed to bind this reservation.

Signed .....

Street Address .....

City .....Zone .....State.....



5 COMPARTMENT STALLS

Frame 1½ in. angle iron, braced, aluminum painted. Covering heavy gauge sheets. Rigid door frames of 1" O.D. pipe, dog-proof mesh filler, and welded to frame. Stands 6" off floor.

Sizes:
3 upper stalls 24"x24"x28"
2 lower stalls 36"x36"x28"
Over-all size 28½"x6' wide x 5'6" high

$149

COMPLETELY ASSEMBLED

Guaranteed Satisfactory



SAFETY

FORD . . .

DOUBLE FRAME

***KENNEL* RUNS**

The low cost will surprise you!

Ford Double Frame Panel Runs insure SAFETY for your dogs. Chain link fabric is rust-resistant, cannot be spread; permanently locked by INNER BAR FRAME. No tie wires to rust. Clamp together. No bolt holes to match. Portable or permanent construction.

Made in sizes to fit your requirements. 4, 5, and 6 ft. heights. Lengths 2 to 14 ft. panels. WRITE FOR LITERATURE AND PRICES.

Kennel Runs — Pup Pens — Stalls and Cages

FORD FENCE CO.

6580 Winthrop Avenue

Indianapolis 20 Indiana

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50, 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra.

Deadline for want ads 22nd of month preceding date of issue.

Names of classified advertisers using key letters cannot be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 So. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Positions

Veterinarian, assistant or similar work. Graduate Brno, Czechoslovakia Veterinarian Academy, 1928. General practice for seventeen years in Lithuania, three years in Germany. Speak Lithuanian, Russian, Czechoslovakian, German, Polish, French, a little English. Age 57, married. Address Dr. R. Buividos, 271 61st St., Brooklyn, N. Y.

Permanent position as an assistant with small animal practitioner. Prefer western United States. D.V.M., 1944, Colo. Considerable small animal experience while in the service. Address "Box R13," c/o Journal of the AVMA.

Wanted—Practices

Two experienced young protestant veterinarians of good character desire to purchase good small animal hospital in Midwestern city, 35,000 to 100,000. Cash. Describe fully. Address "Box R 1," c/o Journal of the AVMA.

Veterinarian interested in partnership or practice in eastern Pennsylvania or southern New Jersey. Licensed in both states. Teaching and practice experience. Address "Box R10," c/o Journal of the AVMA.

Competent veterinarian desires to purchase well established veterinary practice in Illinois. Well qualified for large, mixed or small animals. Will consider partnership. Address "Box R11," c/o Journal of the AVMA.

Graduate of accredited school, highly experienced, wishes to purchase small animal practice with hospital and dwelling if available. Give complete details in reply. Address "Box R12," c/o Journal of the AVMA.

Experienced graduate of accredited school wishes to purchase or lease small animal hospital, preferably in the South or Midwest. Address "Box R14," c/o Journal of the AVMA.

Wanted to buy: mixed practice and equipment somewhere in northern Illinois, preferably near Chicago, by an accredited graduate veterinarian. Address "Box R15," c/o Journal of the AVMA.

Wanted—Veterinarians

Splendid opportunity for veterinarian on clinic staff. Private practice privileges. Humane Society of Missouri, 1210 Macklind, St. Louis 10, Mo.

New Jersey Coöperative Artificial Breeding Association No. 1 of Clinton, N. J., employing only veterinarians, will add another man to its staff in the near future. Address: D. C. Reid, D.V.M., Clinton, N. J.

Experienced veterinarian, 30 to 40 years of age, for progressive, modern small animal hospital in New York City. Living quarters. Good proposition for qualified man. Give full particulars. Photo if possible. Address "Box R 3," c/o Journal of the AVMA.

(Continued on page 36)



Corn Belt Laboratories, Inc.—Corn Belt Serum Co., Inc., East St. Louis, Ill.

"We value the prestige this product gives."

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Dehydrated Culture Media DIFCO

The utmost in efficiency and economy in the bacteriological laboratory is realized through use of Dehydrated Culture Media, Difco.

Convenience — any medium can be instantly prepared.

Stability—media can be kept without deterioration.

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Completeness—no additional ingredients are required.

Uniformity—successive lots are identical.

Comparability—dependable, comparative studies are possible in widely separated laboratories over long periods of time when standardized Difco Products are employed.

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Simultaneously DISINFECTS CLEANS DEODORIZES

- Kills Micro-organisms
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CARROT OIL VITAMINS

Details the advantages of carrot oil vitamins when used in feeds to improve breeding results; to destroy oxidized milk flavors; and to promote general good health and glossy coats. Contains much information. Replete with data and references. Send for it today.

NUTRITIONAL RESEARCH ASSOCIATES
Dept. 251-M, South Whitley, Indiana

New President of Pitman-Moore.—Mr. Kenneth F. Valentine succeeds Mr. Carl N. Angst as president of Pitman-Moore Company of Allied Laboratories, Inc., it was announced on October 1. Mr. Valentine was first employed by the company as a medical service representative in 1932 and was assistant sales manager when he entered the Army Air Forces to serve as an administrative officer. Upon his return to the company in 1945, he was assistant to the president and was promoted to executive vice-president in May, 1946. He was elected to Allied Laboratories' Board of Directors in July of this year.

Mr. Angst has served the company since 1904, rising from an assistant bookkeeper to president in 1935. Under his leadership the company has enjoyed progressive growth, with establishment of sales branches in principal cities and the creation of a Canadian subsidiary. He will continue to serve as director and treasurer of Allied Laboratories, Inc. and will serve Pitman-Moore as a consultant and advisor.

The medical theories and practices of our day are likely to seem as ludicrous a hundred years hence as those of a hundred years ago seem ludicrous now.

A humdinger is an editor who never disappoints a reader nor ever makes a mistake.

Dogs rush for Dash-



It's fortified with LIVER!

95 OUT OF 100 DOGS GO FOR DASH!

Impartial feeding tests in homes and kennels prove 95 out of 100 dogs take to Dash eagerly—right from the start!

You can recommend Dash with confidence!

Armour's 80-year-old reputation for preparation of quality foods stands behind Dash. For Dash has been perfected after years of extensive research and proved by generations of animal feeding tests conducted in Armour laboratories by scientists in the fields of animal and human nutrition. Made according to Armour's kennel-tested formula, Dash is unsurpassed by any dog food today in its fine quality ingredients. Moreover, Dash is fortified with fresh, wholesome liver! Compare the contents on the label of Dash with those of other leading brands of dog food. You'll see then why you recommend the best when you recommend Dash.



Saga of the Horseshoe

Don't speak of "the antiquity of horseshoeing" and get off to a bad start as did a popular columnist the other day. Horseshoeing is definitely not *ancient*. "Antiquity" is the wrong word because the art of nailing iron shoes to the horse's hoof came into being at the dawn of modern times. To stay within the bourne of truth, horseshoeing may be spoken of as a late medieval invention but not as an ancient one. Through all the centuries of the misty past and until the dawn of western civilization, the horse went barefooted and, consequently, its range of operation was limited to slow work and short distances.

True, under the stress of arduous military operations some of the ancient mounts were fitted with "hipposandals" made of leather and sheet iron. They were slipped over the hoof like a man's brogans and held on with straps around the pasterns, chafing and bruising as might be expected. That the raiding armies of Alexander were stopped for weeks while hoofs grew out and sores healed is well-known military history. The private mount of Nero (37-68 A.D.) was shod with hipposandals garnered with gold and silver.

The first iron horseshoe was nailed to a horse's hoof by a Byzantine mechanic at the dawn of the tenth century of the Christian era. From that time, horseshoeing became a proud art. Kings and princes and aristocrats boasted of their skill at shoeing their own mounts.

Before the founding of veterinary colleges and even up to recent times, the urban veterinarians were the horseshoers. Many of them went to college and graduated. Some became distinguished professors. Chabert, horseshoer of the Seven Year War, became the director of the veterinary schools of France. The chair of horseshoeing was once an important part of the veterinary curriculum in this country.

Summed up, the horse was not much good until iron shoes were nailed to its feet at the end of the Middle Ages. From then on, industry, agriculture, and transportation bloomed to make a civilization that endured. Riding on horses with shoes nailed on epitomized ten centuries of progress in human affairs. Make no mistake, the vanishing of horses from the streets and highways and their replacement by trucks and tractors on the farms is unconsciously marking the beginning of a new era for man. At the present time, the relation of the horse to human progress is about the same as it was before horses were shod—useful but of minor importance.

(*Continued from page 32*)

Wanted—Veterinarians

Veterinarian wanted to assume complete responsibility of small animal hospital near Newark, New Jersey. Address "Box R 6," c/o Journal of the AVMA.

Ethical supply house wants veterinarian to travel in central states area. Give references, qualifications and detailed information concerning self on applying. Address S. R., c/o Journal of the AVMA.

City veterinarian to supervise a division of meat and milk hygiene. Beginning salary $250-$325 a month. Address inquiries to Dr. Fred Long, director, City-County Department of Health, Lincoln, Nebraska, stating qualifications and experience.

Assistant for California small animal hospital. No practical experience required. Good future for the right man. Salary $300 a month and room, bath, and kitchen on premises. Address "Box R 7," c/o Journal of the AVMA.

For Sale or Lease—Practices

Mixed practice on Delaware peninsula, town of 7500 with thickly populated surrounding territory. Completely equipped small animal hospital in excellent location. All necessary large animal equipment and large supply of drugs. Ideal weather. Immediate possession. Price: $4,000 cash or terms. Address "Box R 8," c/o Journal of the AVMA.

Best Arkansas Delta cotton and alfalfa mixed practice, stock and equipment. Selling on account of health. Address Dr. C. W. Denman, Hughes, Arkansas.

California practice consisting of small animal hospital and small furnished house to trade for practice in midwest or south, or will sell for real estate appraisal. Address "Box R 4," c/o Journal of the AVMA.

Good dairy practice, room for enlargement, with or without furnished house available for rent, lease, or sale. Address "Box R 5," c/o Journal of the AVMA.

Profitable mixed practice, Virginia. Ideal climate. Industrial town of 10,000. Splendid opportunity for young veterinarian or recent graduate. Reasonably priced. Address "Box R9," c/o Journal of the AVMA.

Small animal hospital for sale or lease. Has large animal possibilities. Opportunity for one or two doctors. Ideally located near Newark, N. J. Address "Box R 2," c/o Journal of the AVMA.

Profitable mixed practice, Virginia. Ideal climate. Industrial town of 10,000. Splendid opportunity for young veterinarian or recent graduate. Reasonably priced. Address "Box R9," c/o Journal of the AVMA.

For Sale—Artificial Insemination Supplies

ARTIFICIAL INSEMINATION INSTRUMENTS—Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

Miscellaneous

FOR SALE—Lot 50 x 183 M1 Zone, Lankershim Blvd., North Hollywood, Calif. Address Jimmie Derbin, 1215 3rd Ave., Los Angeles, Calif., telephone FI 2111.

Veterinarian's portable chutes for vaccinating, castrating, and dehorning. Cizek Mfg. Co., Clutier, Iowa.

Books and Magazines

Charts—World Dog Map, chart all American breeds, terrier trimming chart. $1 each, 3 for $2. Keep informed—Dog World, 1 yr., $3; 2 yr., $5. Judy Publ'g Co., 3323 Michigan Blvd., Chicago 16.



Ready for instant use in treatment of MASTITIS

PENICILLIN CALCIUM OINTMENT VETERINARY is especially prepared for acute or chronic bovine mastitis. It is supplied in 7.5 gram tubes, each containing 75,000 units of penicillin calcium.

Penicillin, in this form, requires no preparation . . . no extra equipment. Simply remove cap. Insert tip of tube in teat orifice. Squeeze ointment into teat canal.

This product is stable, non-toxic, non-irritating—and the penicillin is released at therapeutic levels slowly, thus prolonging curative action. It can be obtained from your favorite source of supply. Or send your inquiry direct to: E. R. SQUIBB & SONS, *Veterinary and Animal Feeding Products Division,* 745 Fifth Avenue, New York 22, N.Y.

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SYMBOL OF A QUALITY

PHEN O BOLES

Trade Mark Reg.

Accurately measured therapeutic dose of phenothiazine in one tablet for sheep, swine, cattle and equines.

25 gram—Box of 25.....$2.20
25 gram—Box of 100..... 7.98
12½ gram—Box of 25..... 1.27
12½ gram—Box of 100..... 4.33

PHENOTHIAZINE

REGULAR N. F. or DRENCH TYPE

1 lb. can (12 to case).....70c per lb.
5 lb. can (5 to case).....68c per lb.
10 lb. drum any quantity....67c per lb.
25 lb. drum any quantity....65c per lb.
150 lb. drum any quantity..58½c per lb.

PENICILLIN

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100,000 Oxford Units.....per vial $ .39
200,000 Oxford Units.....per vial .63
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VITAMINS

OCTO-MINS (8 Vitamin Capsule)

Bottle of 100.....$ 1.50
Bottle of 1000..... 13.00

Calf Capsules—A.C.D. with Niacin

Bottle of 100.....$ 2.75
Bottle of 500..... 13.00

SULFONAMIDES

Sulfanilamide Powder U.S.P.

1 lb. bottle.....$1.65 per lb.
5 lb. drum..... 1.60 per lb.
10 lb. drum..... 1.55 per lb.
25 lb. drum..... 1.50 per lb.
100 lb. drum..... 1.35 per lb.

Sulfathiazole Powder U.S.P.

1 lb. bottle.....$4.52 per lb.

Sulfathiazole Sodium Powder U.S.P.

1 lb. bottle.....$4.60 per lb.

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1116 West 37th Street, Chicago 9, Illinois

Notice to Contributors

Journal of the AVMA

and the

American Journal of Veterinary Research

Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals.

Manuscripts.—Manuscripts must be typewritten, double-spaced, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones. Footnotes and bibliographies also should be typed **double space** and should be prepared in the following style: name of author, title of article, name of periodical with volume, month (day of month, if weekly), and year.

Illustrations. — Photographs should be furnished in glossy prints, and of a size that will fit into the Journals with a minimum of reduction. Photomicrographs which cannot be reduced should be marked for cropping to 1-column or 2-column width. Drawings should be made clearly and accurately in India ink on white paper. Figures appearing on graphs or charts should be large enough to allow for reduction necessary for the chart or graph to fit on Journal pages. All illustrations should bear the name of the author on the back.

Tables.—Tables should be simple. Complex tables are not conducive to perusal. It is wiser to summarize complex material rather than to attempt to tabulate it.

News.—Secretaries of associations and readers are requested to send us announcements of meetings and news items.

AMERICAN VETERINARY MEDICAL ASSOCIATION

600 So. Michigan Avenue

Chicago 5, Illinois

No Can Deny.—The man on the land knows that he is the king-pin of the concern, and that if he were withdrawn, the whole gallimaufry, with its business men and politicians and civil servants and entertainers and black marketeers and playrights and editors and burglars and poets and industrialists, would fall to bits.—*Weekly Wisdom in the Veterinary Record.*

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meets the requirements of a good vaccine. It is a highly potent, sterile, safe, neutral, smooth emulsion and is almost completely non-irritating when injected. Actual tests show that it not only protects against fixed virus, but also against field or street virus.

Recommended Dosage—

Minimum Dose .....5 c.c.

Dogs between 25 and 50 lbs. weight.....1 c.c. for each 5 lbs. weight

Dogs over 50 lbs. weight.....10 to 15 c.c.

Injections should be made subcutaneously.

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